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Vol. 24 Toronto, January 5, 1910 No. 1

Contract Record

ESTABLISHED 1886

In which is incorporated

Architect & Builder

The London
Automatic Batch Concrete Mixer No. 2

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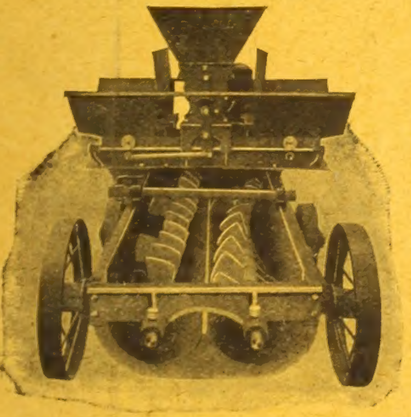

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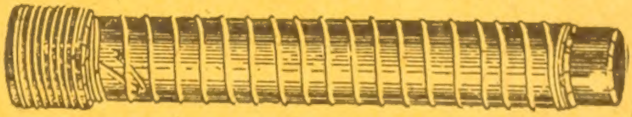

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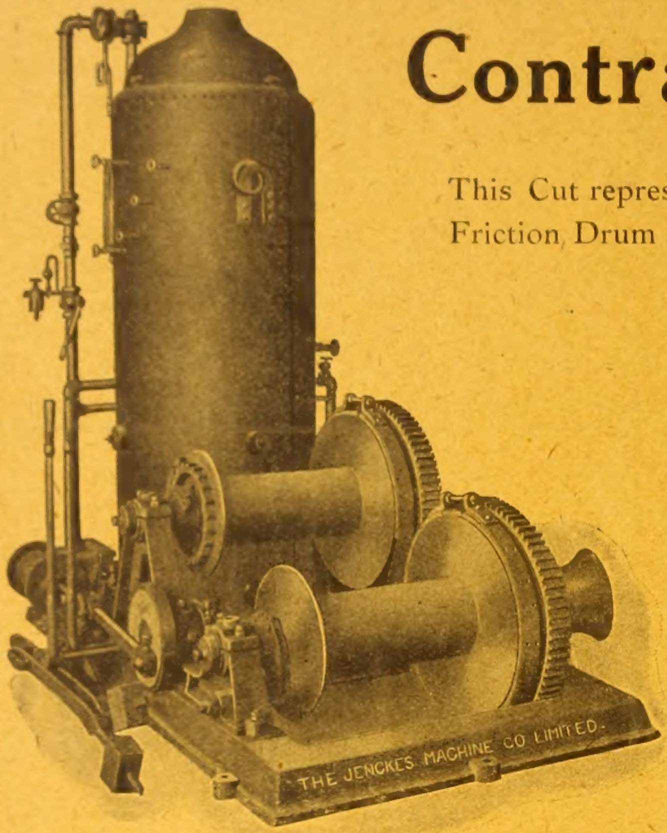

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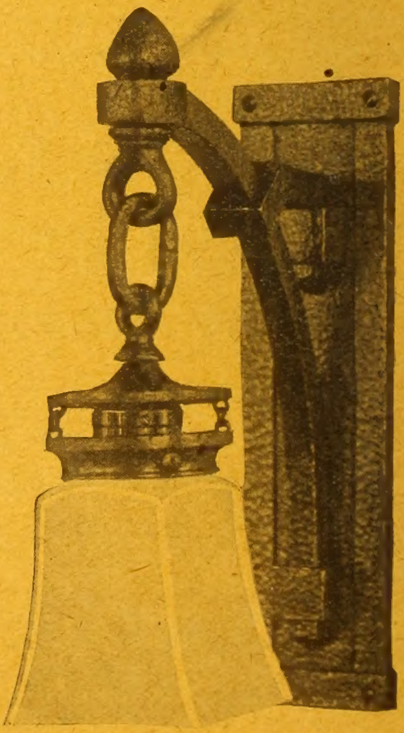

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Nothing demonstrates the high quality of this famous marble like the report of Prof. H. M. MacKay of the Civil Engineering Department of McGill University, Montreal, who made tests of samples of our output. The following is his report :

Gentlemen,—

Following are the results of tests of the samples of marble submitted by you :—

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The compression tests were made upon 2 inch cubes and were carried out in the Wicksteed Testing Machine. :: :: :: ::

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Area of cross section 3.98 sq. inches.
Maximum load 85,100 lbs. 21,380 lbs. per sq. inch.

Sample No. 2

Area of cross section 4.04 sq. inches.
Mamimum load 86,000 lbs. 21,280 lbs. per sq. inch.

"Eureka." Sample No. 1

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Maximum load 84,000 lbs. 21,760 lbs. per sq. inch.

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It will be noted that the compressive strength is exceptionally high and compares favorably with the best grades of granite. :: :: ::

Absorption Test

Two roughly broken samples after having been thoroughly dried were immersed in water for 48 hours with the following results ;—

	Wt. Before Immersion	After Immersion	Gain	%
Sample 1......	1.3770 lbs.	1.3780 lbs.	.0010	0.072
Sample 2......	1.9540 "	1.9555 "	.0015	0.076

Specific Gravity 2.71. Wt. per cubic foot 169.5 lbs. The percentage of moisture absorbed is thus remarkably low, which indicates, in my opinion, a stone which should have exceptionally good weathering qualities.

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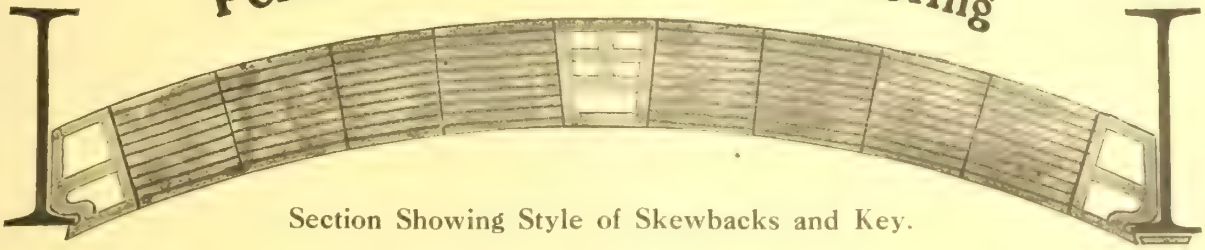

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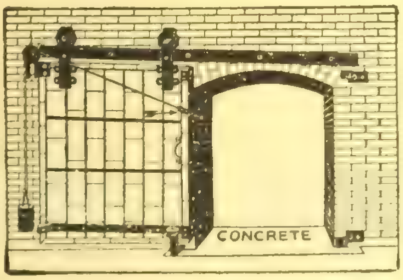

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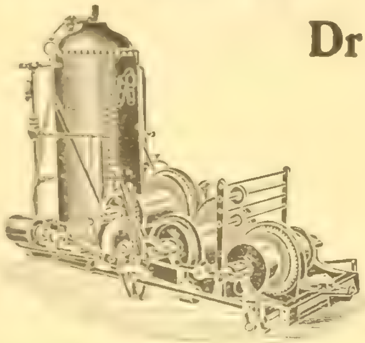

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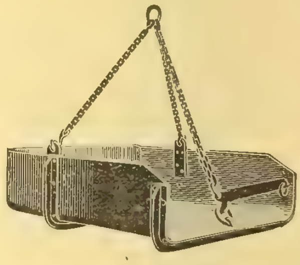

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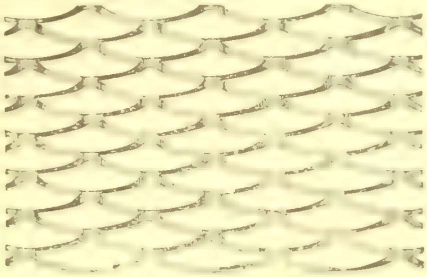
"Not the First Lath but the First Perfect Lath."



"Galt" Lath is expanded *one mesh* at a time—not stretched one *sheet* at a time. That's why it's flat. In making ordinary metal lath the sheet, which has been slitted, is held by the outer edges and stretched. Soft spots in the steel expand out of proportion with the rest of the sheet and produce "bulges" or "bags." This means a springy, elastic, plastering surface. "Galt" Lath is *flat* and presents a *perfectly level* surface on ceiling or walls. Sample?

The Galt Art Metal Co., Limited
Galt - Ontario

Winnipeg	Winnipeg Paint & Glass Co.
Toronto	W. D. Beath & Son
Vancouver, B. C.	D. R. [illegible]
Edmonton	W. B. [illegible]
Calgary	The Standard Supply Co.
Montreal	Wm. M. [illegible] & Son
St. John, N. B.	[illegible] & Co.
Halifax	General Contractors Supply Co.

A Herringbone Resolution

From now on, forever and ever, for the sake of my profits I hereby solemnly resolve never to use any brand of metal lath but Herringbone.

SIGNED ....(seal)

.. . .

Sign your name in the space above. Cut on the dotted line and paste in your hat. When tempted, think of those twisted filaments.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING TORONTO
Metal Shingle & Siding Co., Manufacturers

Port Credit Brick

The Bricks that the **Contractors** who know **The Best** are using.

Other bricks may have a few cents knocked off our price **but,** the building they are put into will have more than a few years knocked off its life.

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Works: Port Credit, Ont.

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HEAD OFFICE VANCOUVER B.C. P.O. BOX 915.

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FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Every part of every "KERR" valve is accurately made and finished.

Valves for every requirment of waterworks service.

Latest and best designs.

Valves
Valve Boxes
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Hydrants

The Kerr Engine Company
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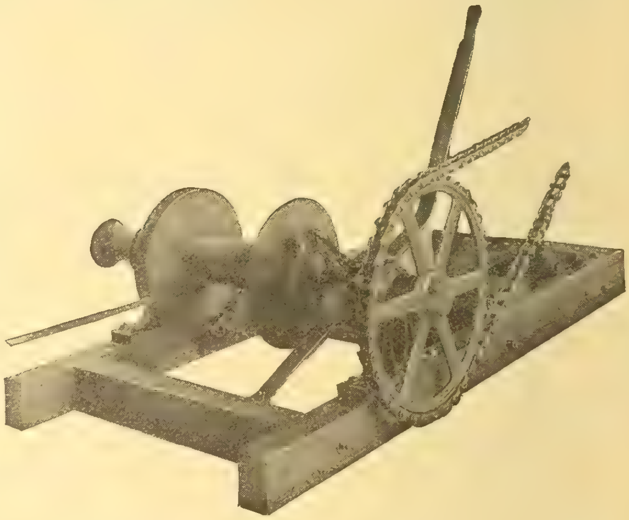
Hydrant and Valve Manufacturers
WALKERVILLE, Ontario

"London" Friction Clutch Hoist



We have designed and perfected a hoist that would meet the demand for a simple and durable hoist at a moderable cost. The "London" is a powerful hoist for use with any style of Gas, Gasoline or Oil Engine.

The Scott Machine Company
Limited
Engineers and Machinists **London, Canada**

[illegible], President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
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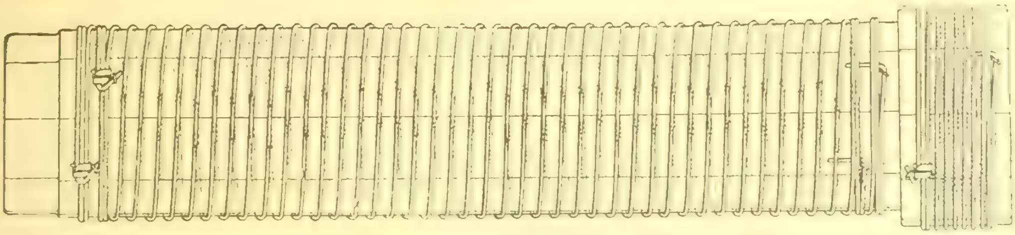
Manufacturers

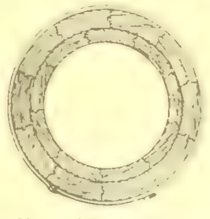
Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.





End View of Pipe and Coupling

The Dominion Wire Wound Wood Water Pipe

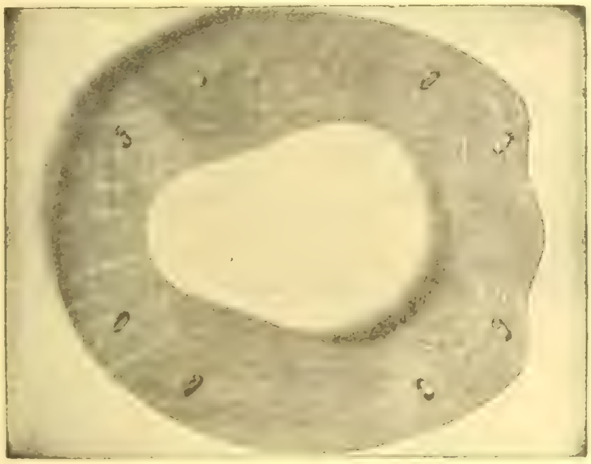
Showing special method of winding with two independent parallel wires. The great advantage of this is that in event of one wire becoming damaged the pipe still retains a factor of safety of 2.5. Made only by

The Dominion Wood Pipe Company, Limited New Westminster, B.C.

Also Manufacturers of Continuous Stave Pipe for Irrigation and Power Purposes. Write for Catalogue.

"Never-Split" Closet Seat

Architects and contractors who desire the reputation of always choosing the best material will act in their own interests by specifying the "NEVER-SPLIT" CLOSET SEAT.



These seats are make in four sections which are tongued and grooved, glued together and held rigid by a heavy bolt at each joint.

Goderich Organ Co., Limited Goderich Ontario

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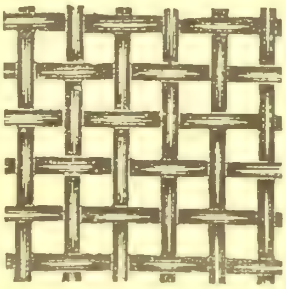

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for all purposes of Steel, Iron, Brass, Copper, Bronze, Galvanized and Tinned Wire, etc.

There is no kind of Wire Fabric required in the production of any machine or manufactured article that we cannot furnish.

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Bank and Office Grilles and Ornamental Iron Work in all finishes

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Head Office: Montreal, P. Q.

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, Etc. Castings of All Kinds.

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Unequalled in fineness and quality. Fully Guaranteed.

Present capacity 500,000 Barrels Annually.

BUFFALO BRAND

Also the largest Manufacturers of Pressed Brick in the Western Provinces. Quality unexcelled. Write for Prices.

The Name Superior Brand

represents the very highest quality of Portland Cement. **Superior brand** is the cement to use if you have a contract where the specifications are exacting. It can be relied on to fill requirements.

Superior brand is uniformly the finest ground cement in the Canadian Market—hence the strongest.

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Fire Bricks

Fire Clay

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STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

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G. W. ESSERY, Manager

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High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

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All Sizes—For Concrete Road-work and Sidewalks.

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Corinthian Stone

is made of **stone**; **is** of the **same material** from **face** to **back**; **can** be **cut** or **carved** similar to natural stone; is **specified** by **leading Architects. For prices** for all kinds of Ornamental Work, Sills, Heads, Ashler, etc., write

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Who are the SOLE MANUFACTURERS of "CORINTHIAN STONE"

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"Judge a Cement by its Works."

Sold under a **guarantee** other portlands cannot make in **good faith**. That guarantee is backed by the **oldest** and most **responsible manufacturers in the world**.

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Selected for **PANAMA CANAL** in Preference at Equal Prices and has exceeded those severe requirements.

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Alsen's has now been awarded the largest contract ever let for one brand of cement which specifies 1,100,000 barrels of Portland, the Ashokan Dam, New York State.

The best color and most **durable for cement blocks and sidewalks.**

Write for list of other important works in all sections

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Contractors for
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MANUFACTURERS OF

Wire-Wound Stave Pipe
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Agents for Waterworks Supplies

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Cast Iron Water and Gas Pipes and Specials

Carried in stock, from 2" to 12", for prompt shipments. Standard Weights and Tests.

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QUEBEC, 76 Peter Street —AND— **MONTREAL, Coristine Building**

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Wire Lath

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The B. Greening Wire Co.
Limited
Montreal, Que. - Hamilton, Ont.

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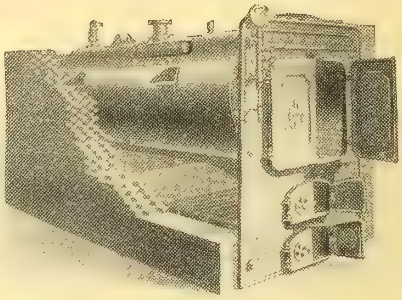

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FOR
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E. LEONARD & SONS, Engine and Boiler Manufacturers, **LONDON, ONT.**

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Mills Running all Winter

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Hardens with Age. Low Price. Samples and Quotations Free

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For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material: best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

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Star Portland Cement

The oldest and highest-grade of Canadian Artificial Portland Cement made.

Star has been used during the past twenty years more widely and more largely than any other single brand, either domestic or foreign, in the best classes of hydraulic and other structural work throughout the Dominion.

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Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co.
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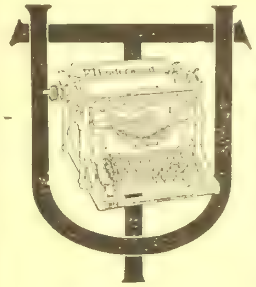
Woodstock, Ont.



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Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
Bored and Bundled.

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Capitals, Brackets and Lignine Carvings made of our Comp. Material are fashioned to suit any form of architecture.

We finish our ornaments to match any kind of wood or stone

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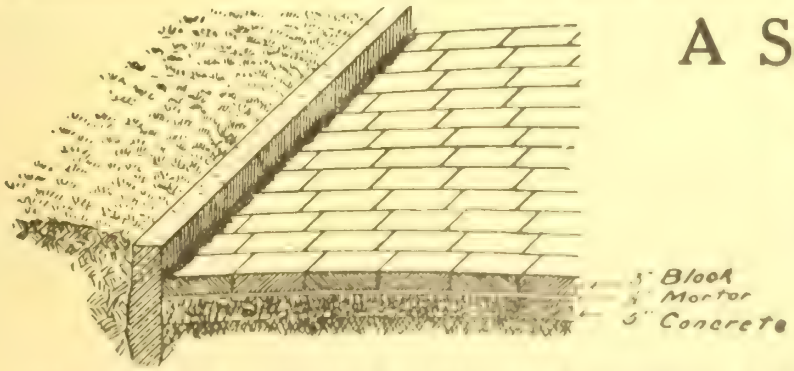

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must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature
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Easily Repaired and Easily Cleaned.

These Requirements are Met by

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WM G. HARTRANFT CEMENT CO. LTD.
MONTREAL P.Q.
SOLE SELLING AGENT
MONTREAL P.Q.

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"Vulcan"

Other brands are claimed to be "as good as Vulcan" but why experiment with the "just as good" kind when you can have the standard itself for the asking. Vulcan Cement is

Strong—Uniform—Finely Ground—Carries sand well—Has an exceptionally good color and is positively without any equal for all high-class work.

Always demand Vulcan whether ordering direct or through your Supply House.

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OUR ARGUMENTS FOR SOLICITING YOUR BUSINESS ARE EXCELLENT.

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity.
New and well equipped factory with latest and best machinery.
Experienced workmen under the most expert supervision. ::

GIVE US A TRIAL ORDER OUR WORK WILL CONVINCE YOU

Georgian Bay Shook Mills, Limited
Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

High River, Alta.
P. Turner-Bone, of Calgary, Alta., has outlined plans in connection with sewerage and waterworks here.

Hamilton, Ont.
The ratepayers approved a by-law to raise $200,000 for good roads.

Prescott, Ont.
$5,000 was voted for the extension of sewers here.

Sault Ste. Marie, Ont.
The ratepayers approved by-laws for the extension of sewers and sidewalks.

St. John, N.B.
The civic Board of Works has recommended that $96,000 be expended on permanent street paving, at the rate of thirty to forty thousand per year, and that tenders be called.

St. Boniface, Man.
A bylaw to raise $200,000 for the construction of a sewer 7 feet in diameter and 1½ mile in length, to cost $200,000, will be submitted to the ratepayers.

Thamesville, Ont.
The ratepayers voted to raise $10,000 for waterworks.

Wingham, Ont.
The water and sewer by-laws were carried by the electors.

Winnipeg, Man.
The Board of Control, which has been experimenting with ventilators and Webb lamps as a means of deodorizing sewer air, have decided to install the ventilators as cheaper and more efficient. About four hundred will be required for the city, compared to 800 lamps, and the cost will be about $20,000, compared with $200,000 for the lamps.

AWARDED.

Buxton, Ont.
F. Smithson has been awarded the contract for sewer construction by the Raleigh Township Council at $3,388.

Winnipeg, Man.
M. Peterson, Secretary, Board of Control, states that the contract for plumbing and sewer connection (list 24) has been awarded to G. L. Stephenson, this city, at $357.50. T. Ball tendered at $361.25.

Railroads, Bridges and Wharves

Calgary, Alta.
The bridge over the Elbow, referred to in issue of December [illegible], is estimated to cost $30,000 and will be of sufficient strength to carry street cars, as the present system will be probably extended [illegible] the district served by the bridge. Mayor Jamieson is reported as having stated that 1910 extensions will be definitely mapped out during February.

Esquimalt, B.C.
It is learned that negotiations are progressing between the Imperial and Dominion Governments which may result in the establishing of a naval base of considerable proportions on Vancouver Island. The present works at Esquimalt will be utilized in the proposed extension. It is rumored that the authorities at Ottawa are prepared to provide $10,000,000 for the purpose of constructing docks and other accommodations.

Edmonton, Alta.
The cost of the substructure of the C. P. R. bridge here is placed at about $500,000. It will involve about 40,000 yards of concrete work.

The money by-law to provide the sum of $246,000 to be used for constructing the traffic, pedestrian and street railway decks of the C. P. R. high level bridge over the Saskatchewan river was endorsed by the ratepayers. The C. P. R. has promised to commence the immediate construction but cannot do so owing to the fact that the plans must be approved by the provincial legislature. The work will be delayed until after February 15. Noted in issue of December 8th.

Montreal, Que.
An appropriation, subject to the approval of the board of directors, was made providing for the construction of fifty miles of the Kootenay Central Railway this year. There is every reason to believe that the grant will be ratified. It is proposed to start work early in March on the Crow's Nest Pass Railway. Tenders will likely be called for early in February.

North Vancouver, B.C.
The adjoining municipalities and the parties proposing to incorporate the Burrard Inlet Tunnel & Bridge Company have applied for authority to build a tunel under the First Narrows and a bridge over the Second Narrows of Burrard Inlet. Reeve McNaught, this place, is interested. Noted in issue of November 24th.

Outlook, Man.
Tenders will be received by the Assistant Chief Engineer of the C. P. R., Winnipeg, Man, until January 22nd for erection of substructure of bridge over the Saskatchewan river. Plans, etc., at the following offices: A. L. Hertzberg, Division Engineer, Toronto; C. N. Monsarrat, Bridge Engineer, Montreal; N. E. Brooks, Division Engineer, Calgary, Alta.; C. E. Cartwright, Division Engineer, Vancouver, B.C.; and J. E. Schwitzer, Assistant Chief Engineer, Winnipeg.

Ottawa, Ont.
It is stated that three English, four United States and two Canadian bridge building firms have made enquiries re the tendering upon the Quebec bridge construction. It is understood that two of the largest Canadian companies are likely to unite in putting in a bid. Save for the construction of additional piers, [illegible] can be done during the year 1910. While the plans will be open for inspection at Montreal next week, tenders will not likely be called till the 1st of May, the job being so extensive as to require a lot of figuring by the bidders. The contract will not be awarded for some weeks after that. Some of the prospective bidders claim to have the capacity for turning out the bridge castings within a year.

Prince Albert, Sask.
The G. T. P. bridges across the south branch of the Saskatchewan at St. Louis, on the proposed line between this city and Watrous, will be built this winter.

Toronto, Ont.
Tenders addressed to J. Oliver, Chairman, Board of Control, will be received until January 18th for the supply of timber piles and driving of same for the bridge on the extension of Wilton avenue crossing the River Don. Specifications at office of City Engineer Rust, this city.

Unionville, Ont.
The by-law to raise $32,000 for bridges was defeated.

Winnipeg, Man.
Plans for the construction of a bridge over the C. P. R. track at Brown and Brant streets have been examined. They call for an expenditure of about $250,000 and have been sent to the railway commission and the C. P. R. for approval.

AWARDED.

Edmonton, Alta.
The McInnis Lumber Company have received the contract for the supply of bridge and culvert timber and fence posts to be used in constructing the first 100 miles of the Alberta & Great Waterways Railway. Noted in issue of December 29th.

Hamilton, Ont.
M. S. Kappelle has been awarded the contract for supplying 40,000 feet of timber for re-decking the Stewart bridge at $978.96.

Vancouver, B.C.
Murray Bros. secured the contract for the erection of the pipe-railing on the Westmintser avenue bridge at $1,472.

Public Buildings, Churches, Schools, etc.

Amherstburg, Ont.
A by-law to provide $20,000 for the erection of a new school was approved by the ratepayers.

Beaverton, Ont.
The new town hall by-law was [illegible] by the ratepayers.

Chilliwack, B.C.
A by-law will be submitted to raise the amount required to buy a site and erect a school building. Estimated expenditure [illegible].

Edmonton, Alta.
The [illegible] has decided to erect a club house at a cost of $100,000. Work will be commenced in the spring.

Fergus, Ont.

The ratepayers approved a by-law in favor of the erection of a free library.

Forester's Falls, Ont.

Tenders addressed to F. R. [illegible], secretary-treasurer S.S. No. 6, will be received until January 22nd for the erection of a school house. Plans, etc., at office of Stewart Bros., Renfrew, or at the office of the secretary-treasurer, this place.

Galt, Ont.

The by-law to raise $5,000 for the extension of the market was defeated.

Granby, Que.

Tenders for the erection and construction on the race track of the "L'Hippodrome Granby Limitee" will be received up to the 7th January. Address L'Hippodrome Granby, Limitee.

Goderich, Ont.

A new Masonic temple will be erected in the spring at an approximate cost of $12,000. Stores, ground floor; club rooms and offices, second floor; hall, reception and banqueting room, top floor. A. J. Barclay, architect.

Hamilton, Ont.

By-laws providing for the erection of registry office and to raise $50,000 for new police offices, station and cells, were approved at the recent elections.

Halifax, N.S.

It is reported that the local Masonic lodges have purchased the lot at the north corner of Salter and Barrington streets. Nothing can be done with the property until the meeting of the Grand Lodge next summer, when it is hoped that a lodge will be erected, or, that failing, a building for commercial purposes will probably be erected.

Killarney, Man.

A by-law to complete the town hall at a cost of $10,000 has been carried.

The installation of a heating plant in the town hall, to cost about $3,000, is being considered.

Lindsay, Ont.

The by-law for the erection of new ward schools carried.

London, Ont.

It is stated that the incoming Board of Education will recommend the rebuilding along modern lines of the Colborne street school.

Markdale, Ont.

Plans were presented to the town council for the erection of a new town hall on the present site of the Marsh Hall, to cost about $6,000.

New Westminster, B.C.

Prizes of $400 for the first, $300 for the second, and $200 for the third, are offered by the board of managers of the Royal Columbian Hospital for competitive plans for the new building on which construction is proposed to be started by March. The building is to cost around $100,000, and be able to accommodate 100 patients. The competition is open to all, and will close about the first of February. Noted in issue of December 1st.

Owen Sound, Ont.

The ratepayers approved by-laws to build a new library and a new wing to the general hospital, and defeated a measure to spend $7,000 on the old town hall.

Ottawa, Ont.

A building permit has been granted for the new theatre to be erected on Queen street. Estimated cost, $25,000. W. H. George, architect.

The ratepayers voted in favor of the by-laws for improvements at the city hall and the construction of an incinerator.

Smith's Falls, Ont.

The electors decided in favor of spending $46,500 upon the erection of a new Collegiate Institute.

Peterborough, Ont.

The electors defeated a measure to raise $19,000 for the erection of an isolation hospital.

Parry Sound, Ont.

A by-law to raise $25,000 for the erection of a municipal building was defeated.

St. John, N.B.

The Board of Directors of the Children's Hospital have purchased two and a half acres of land where the institution formerly known as the Ladies' College in St. John stood for $20,000. The permanent building will be erected as soon as finances permit.

St. Catharines, Ont.

A by-law to grant $15,000 to a new hospital was defeated.

Tenders addressed to N. Tessier, secretary, Department of Public Works, Ottawa, Ont., will be received until January 14th for post office fittings. Plans, etc., on application to Mr. A. Clark, local caretaker, post office; Mr. T. A. Hastings, custom house, Toronto, and at the Department of Public Works, Ottawa.

Teeswater, Ont.

The ratepayers approved a by-law in favor of the erection of a public library.

Toronto, Ont.

The Board of Education have purchased property adjoining Elizabeth Street School, where the intention is to erect an addition.

The Presbyterian Church will erect a new building at the northeast corner of Elm and Elizabeth streets at an estimated cost of $35,000. Rev. S. B. Rohold, superintendent.

Plans are being prepared for a new residence for Victoria College to accommodate 150 students. Stone construction, Gothic style of architecture. A feature will be a dining hall to accommodate 250. A dean's residence will be attached to main building. Architects, Sproatt & Rolph, 90 Yonge street, Toronto, Ont.

The bylaws to appropriate $320,000 for new Exhibition buildings and $262,000 for fire-halls and police stations were carried.

The Canadian Order of Foresters is preparing to build on the lot on the north side of College street, near Yonge, owned by the society. Application for a building permit has been made to the city architect. The structure is to be a five storey office building and Foresters' Hall. The cost is estimated at $50,000.

The revised plans for the new St. Paul's Churhc on Bloor street have been adopted. Estimated expenditure, $231,000. Noted in issue of December 8th.

The new Baptist church, mentioned in the issue of December 22nd, will be built on the corner of Queen and Callendar streets at a cost of about $40,000. Tenders will shortly be called. Architects, Burke, Horwood & White, 28 Toronto St.

Victoria, B.C.

A bylaw to raise $184,000 will be submitted to the ratepayers on January 13th for school purposes.

The Government has acquired the entire square bounded by Belleville, Government, Superior and Menzies streets, and, it is stated, will proceed at once to consider designs and plans for the additions to the Provincial buildings. F. M. Rattenbury, former architect, will be asked to report.

The tenants occupying buildings on the site chosen by the Y. M. C. A. will vacate on February 1st, when tenders for the excavation will be called. Plans committee, E. W. Whittington, W. A. Gleason, and R. C. Horne. A. J. Brace, secretary. Noted in issues of December 15th and 22nd.

Vancouver, B.C.

It is stated that Mr. T. Matthews will erect on the northeast corner of Pender and Abbott streets a new fireproof theatre at a cost of more than $75,000. Plans have have been prepared by A. J. Bird, architect, and approved by Building Inspector Jarrett. Work will be started early in the spring.

The Royal Vancouver Yacht Club have decided to replace their club house recently destroyed by fire by an up-to-date building to cost $10,000. Building committee, R. H. Alexander, J. J. Banfield, C. A. Godson and others. Contracts will probably be let at the end of the month. Noted in issue of December 29th.

Waterloo, Ont.

The ratepayers have approved a by-law for the erection of a new market building.

Winnipeg, Man.

The by-law for baths has been sanctioned.

AWARDED.

Montreal, Que.

The following tenders for tile flooring for the city hall building have been received: Calkins Tile & Mosaic Company, Montreal, $840; G. Gilbert, Montreal, $900; A. T. Riopelle, Montreal, $13,350. The lowest was accepted.

Residences

Halifax, N.S.

Herbert E. Gates, architect, has prepared plans for additions to house for Mr. A. L. Wood on Morris street, for a house on Coburg road for G. A. J. Boak and for house at Bedford, N.S., for Dr. C. F. Fraser, also for additions to Waegwoltic Club House, Halifax, N.S.

Montreal, Que.

The residence of Mr. Barry, of the firm of J. Barry & Sons, 179 McGill street, was badly damaged by fire on or about the 27th ult. Estimated loss, $8,000.

Building permits include: A. Beaudlie, 607 Mentana street, one house containing one dwelling, $3,000; Deguise & Cloutier, 1890 St. Catherine street east, two houses containing four dwellings, $4,000; Jos. Rinfret, 5916 Berri street, one house containing five dwellings, $6,000; Mad. Martel, 883 Drolet street, one house containing three dwellings, $3,000; M. D. Riopel, 527 Rachel street, two houses containing six dwellings, $8,000; Adelard Tremblay, Forsyth street, two houses containing six dwellings, $4,500; J. E. Birks, Cedar avenue, one house containing one dwelling, $7,500; Jos. St. Jean, 308 Cartier street, alterations to property at 920 Dorchester street, $1,500.

Quebec, Que.

It is reported that Mr. L. P. Pelletier, acting for the St. Louis Hotel Company, has purchased the old Academy of Music property. It is understood that a large apartment house is among the plans.

Toronto, Ont.

The residence occupied by Mr. E. P. Brown, 107 Woodlawn avenue, was damaged to the extent of $4,000 by fire on the 29th ult.

Recent building permits include: W. J. Brooks, pair semi-detached two storey brick dwellings, St. Clarens, $4,500; J. M. Ternley, two storey brick dwelling, near Sorauren, Fermanagh, $3,000; F. Gentle, three storey brick store and dwelling, corner of College and Beatrice, $4,000; R. Temple, two storey and attic brick dwelling, Russell Hill road, $5,800; Agnew Bros., pair semi-detached two storey brick dwellings, Riverdale, $5,000; J. Farrell, pair semi-detached two storey brick dwellings, corner of Campbell and Sarnia avenue, $4,000; J. Curry, two storey brick addition to apartments, northwest corner Church and Charles streets, $16,000; R. C. Vaughan, two storey and attic brick dwelling, Russell Hill road, $5,000; S. Weber, pair semi-detached two storey and attic brick dwellings, Simcoe street, $6,000; Star Publishing Company, three storey brick addition to printing office, King street west, $10,000; T. W. Barrett, three detached two storey and attic brick dwellings, Howard Park avenue, $7,500; Mrs. M. Smith, pair semi-detached and one detached two storey frame dwellings, Kingston road, $4,000.

Victoria, B.C.

It is reported that a large apartment house of brick and stone is to be erected on the corner of Government and Elliott streets. R. Hetherington has the contract for the removal of the building occupying the site at present.

Vancouver, B.C.

The following building permits have been issued recently: Mrs. H. J. Gilbert, frame dwelling, 2425 First avenue, $5,000; R. Alexander, frame dwelling, 1640 Larch street, $5,000; Wakley & Bodie, frame dwelling, 1290 Eleventh avenue, $5,000.

Business Buildings and Industrial Plants

Altona, Man.

A business block occupied by the Bank of Montreal and others and Massey-Harris warehouse were destroyed by fire on the 27th ult. Total estimated loss, $20,000.

It is stated that the Bank of Montreal has purchased a corner lot with 75 feet frontage, where a new bank building will be erected.

Brandon, Man.

The plans for the new four storey hotel to replace the present Brunswick have been approved. W. A. Elliott, architect. Noted in issue of November 10th.

As the result of negotiations between representatives of the city and the C. N. R. two more storeys will be added to the new hotel, making it one of not less than 100 rooms. Mayor H. L. Adolph and Ald. M. Mackenzie are interested.

Barrie, Ont.

The ratepayers defeated a by-law for the loan of $20,000 to the Barrie Carriage Company.

Collingwood, Ont.

The Morrill Shipyard by-law was approved by the ratepayers.

Durham, Ont.

The by-law guaranteeing the debentures of the McGowan Milling Company for $15,000 was approved at the recent elections.

Essex, Ont.

Several buildings, four of which were owned by Mr. J. E. Stone, implement dealer, were destroyed by fire on the 30th ult. Total estimated loss, about $60,000.

Fernie, B.C.

P. Zarotti will build a new hotel in New Michel.

The Home Bank will erect in the spring an office building where the Trites-Wood block stood.

Guelph, Ont.

General Superintendent Osborne, of the C. P. R. has stated that a new station will be built here. The construction work will start early in the spring.

Halifax, N.S.

The Dominion Chair Factory at Bass River, Colchester county, was destroyed by fire on the 30th ult. Estimated total loss, $25,000. E. Fulton, managing director.

Kingston, Ont.

The store occupied by Messrs. Crumley was damaged by fire on the 20th ult. Estimated total loss, $5,000.

Montreal, Que.

The premises of the Canada Leather Goods Company was damaged by fire to the extent of about $5,000.

The Carleton Hotel Company have been incorporated with a capital of $2,000,000. The incorporation is in the names of R. T. Heneker, A. H. Duff and W. S. Johnson, advocates. Noted in issue of November 24th.

At a meeting of the St. Louis council the plans for the construction of a new station by the C. P. R., to replace the old Mile End station, were considered and an agreement to have the station built during the coming year was approved of, signed by the Mayor and sent to the Railway Commission for approval.

The Saxe Clothing store, corner of St. Catherine and St. Lawrence boulevard was destroyed by fire on the 30th ult. Total estimated loss, $25,000.

Niagara Falls, Ont.

The Niagara Falls milling plant, corner of Clark and Robinson streets, was destroyed by fire on the 31st ult. Estimated total loss, $50,000.

Port Dalhousie, Ont.

The by-law granting fixed assessment to the Maple Leaf Rubber Company was approved by the ratepayers.

Port Dover, Ont.

The ratepayers have voted in favor of granting a free site and $10,000 to an implement company to locate here.

Parry Sound, Ont.

By-laws to loan $30,000 to the Union Iron Works for the establishment of an iron working plant and to grant a bonus of $10,000 for the erection of an alcohol plant were carried.

Prescott, Ont.

The by-law granting [illegible] and a small bonus to an Ogdensburg soda pulp factory to locate [illegible] was approved by the ratepayers.

Prince Albert, Sask.

It is stated that J. F. MacKenzie will erect a [illegible] here to cost about $50,000. Winnipeg capital is interested.

Regina, Sask.

Mayor Williams, it is stated, has purchased property on Eleventh avenue and Hamilton street, on which, the intention is, to erect a brick and steel departmental store.

St. Hyacinthe, Que.

The building occupied by the Eastern Shoe Company and others was destroyed by fire on the 26th ult.

Souris, P.E.I.

Plans have been prepared for store building for J. J. Hughes & Company, size 50 x 100 feet. C. B. Chappell, Charlottetown, architect.

Sydney, N.S.

A plebiscite will be taken on January 8th to consider the proposition of the National Rolling Mills, to locate here. In the event of that taking place, work would be started on the construction of a plant about February.

St. John, N.B.

The building at present occupied by the Auer Light Company has been purchased by J. M. Robinson & Sons, Prince William street. The intention is to thoroughly overhaul and remodel.

Thessalon, Ont.

The buildings occupied by the Wilson Printing Company and others were destroyed by fire on the 29th ult. The Sandie block, the Imperial Bank premises, the Masonic Hall and the Opera House were also badly damaged. Total estimated loss, $5,000.

Three Rivers, Que.

The Canada Iron Corporation have decided to rebuild their iron pipe foundry which was destroyed by fire several weeks ago.

Toronto, Ont.

The offices of the Jones & Moore Electric Company, 296 Adelaide street west, were badly damaged by fire recently. Total estimated loss, $5,000.

The Toronto Wire, Nail & Tack Company will build a one-storey brick factory on Edwin street at a cost of $4,500.

The Star Publishing Company will put up a three storey brick addition to their printing office at a cost of $10,000.

The Bell Telephone Company will erect a new north exchange, with a regulation ten thousand unit board, to take the place of the present Hayden street exchange, as soon as the spring weather permits. A suitable site has been bought on Bismarck street, about 160 feet east of Yonge street.

It is stated that the site recently purchased by the Metropolitan Bank on the corner of Bay and Adelaide streets will be used eventually for the head office.

Tenders are being invited until January 5th for the clearing of present site and [illegible] for the Union Bank, southeast corner Bay and King streets. [illegible]

Victoria, B.C.

[illegible] Plans call for steel, buttressed by brick, [illegible] 000. It is expected that it will be finished [illegible]

Vancouver, B.C.

[illegible]

[illegible] and [illegible] of the Jordan improved [illegible] street car fender and other inventions of Mr. [illegible] Jordan of this [illegible]. Negotiations are now in progress to secure a building site near the city.

Windsor, N.S.

The store occupied by W. H. Roache was destroyed by fire on the 30th ult. Total estimated loss, [illegible].

Winnipeg, Man.

The Kilgour Rimer Company are extending their premises on Princess street by building a five storey addition to cost about $100,000. Paulin Chambers Company are erecting a big office and distributing block behind their present factory.

It is rumored that the Marshall-Field Company, of Chicago, has purchased a site on Portage avenue for a departmental store. Price involved, $950,000.

AWARDED.

Edmonton, Alta.

The contract for A. Cristall's new five storey business block on First street has been awarded to C. R. Sloan for about $100,000.

Toronto, Ont.

Sproatt & Rolph, 90 Yonge street, have awarded the following contracts for the new building to be erected on Centre avenue by Col. J. B. MacLean: Masonry, W. Hughes; carpentry, A. Weller & Company; reinforced concrete, floors, columns and beams, Leach Concreting Company; steel frames, Expanded Metal Company; roofing, A. Matthews.

Victoria, B.C.

G. C. Mesher & Company have secured the contract for the construction work on the new building for the Colbert Plumbing & Heating Company, Limited, to be situated on Fort street next to the old Philharmonic Hall. Work will be commenced within the next few weeks.

The alterations to the premises at present occupied by T. N. Hibben & Company on Government street will be undertaken within a short time, the contract having been awarded to W. F. Drysdale.

Power Plants, Electricity and Telephones

Brantford, Ont.

Application has been made to the Council by T. R. Varding, of Buffalo, N.Y., for a franchise to construct and operate an electric railway in the township of Brant.

Brampton, Ont.

The ratepayers have approved a by-law to raise $40,000 for a distribution plant.

Bridgeburg, Ont.

The ratepayers have passed a by-law granting to the Canadian Niagara Power Company the privilege of bringing electric energy into the town.

Dundas, Ont.

The by-law authorizing a contract with the Hydro-Electric Commission was carried at the recent elections.

Ingersoll, Ont.

The by-law to raise $30,000 for the erection of an electrical ditsribution plant was defeated by the ratepayers.

Kingston, Ont.

The by-law confirming an agreement between the city and the Trenton Electric & Water Power Company for a franchise to light the city for three or five years was approved by the ratepayers.

Lethbridge, Alta.

The power house of the electric lighting plant for the city was entirely destroyed by fire on the 31st ult.

Montreal, Que.

It is reported that a project is under way to build a six track subway from the eastern end of the city to the western, taking in all the railway stations, etc.

Norwich, Ont.

The power by-law was approved by the ratepayers.

Ottawa, Ont.

The ratepayers have approved the purchase of the Metropolitan Light & Power plant.

Prince Rupert, B.C.

The Board of Trade is agitating the installation of a civic lighting plant. It is not expected that anything will be accomplished as it is probable that the Columbia Tie & Timber Company's sawmill at Seal Harbor will be rebuilt and a larger electric lighting plant installed in connection with it.

Port Arthur, Ont.

An extension four miles in length will be built by the Port Arthur & Fort William Electric Railway during 1910. N. C. Pilcher is purchasing agent.

The ratepayers approved the power by-law at the recent elections.

The Conmee power by-law was defeated by the ratepayers.

Peterborough, Ont.

The by-law in favor of a thirty-year agreement with the Peterborough Light & Power Company was carried.

Quebec, Que.

It is reported that the Quebec Railway, Light & Power Company will soon place contracts for the construction of a sub-station at Ste. Anne de Beaupre. The company has submitted a proposition to the council of Montcalmville for the extension of its tracks from the boundary of the city of Quebec through the municipality to Cape Rouge and St. Foye Church.

St. Thomas, Ont.

The ratepayers defeated a by-law to raise $25,000 for street railway improvements.

Stratford, Ont.

The ratepayers defeated the by-law to raise $108,000 for the purchase of the electric light plant.

Toronto, Ont.

Milton, Toronto Township, Port Credit, Mimico and Brampton have made application to the Hydro-Electric Power Commission for electricity. If the service is furnished another transformer station will be established.

Vernon, B.C.

The council have endorsed the scheme for an electric railroad, the supplying of power and light, which Mr. E. G. Warren, representative of the Couteau Power Company, presented. Involved expenditure, $2,000,000.

Vancouver, B.C.

At a recent meeting of the B. C. E. R. managers the car-building programme for 1910 was mapped out. It calls for five powerful locomotives and 100 freight cars and 38 double truck cars of the latest type, as well as additional equipment for Victoria, etc. Estimate outlay, $500,000. Approval of the London board received. Contracts for the part of the equipment not supplied by the New Westminster shops, will be called for.

Welland, Ont.

An electric railway will be built in the near future between Niagara Falls, Welland and Dunnville, a distance of about fifty miles, with branch lines. The following are the directors: J. Carlton Gardner, engineer, Niagara Falls; William Maxwell, the Dain Manufacturing Company, Welland; F. S. Buell, capitalist, Buffalo; F. R. Lalor, M.P., merchant, Dunnville. Hugh A. Rose, Welland, is solicitor for the company.

Winnipeg, Man.

In the installation of the municipal lighting and power plant, Prof. L. A. Herdt, of Montreal, has associated with him W. Kennedy, jr., and Prof. Ruttan, of Montreal, Que. Estimated expenditure, $3,000,000. Noted in issue of December 29th.

The contract for the construction of the terminal power station at Point Douglas is to be let at once. The building will stand aproximately on 60 feet by 100 feet, two storeys in height and of brick with stone foundation. Estimated expenditure, $308,800.

AWARDED.

Calgary, Alta.

The street railway commissioners recommended that the Ottawa Car Company's tender for three car bodies and Brill trucks, total $3,145 f.o.b., Chicago, be accepted, and that the Preston Car & Coach Company's tender for three car bodies and Brill trucks, total $3,193 f.o.b. Preston, be accepted. The commission also recommend that three sets of Canadian Westinghouse brakes be secured at $395 per set, f.o.b. General Electric Company's brakes at $325 per set f.o.b. Peterborough. They advise the acceptance of the Westinghouse Company's tender for controllers, viz.: $333 per car f.o.b. Hamilton. This includes trolley base, motor, cables, controllers and circuit breaker. Noted in issue of December 29th.

Edmonton, Alta.

The contract for telephone poles for the Alberta Government telephone service has been awarded to W. Lennard, of Wabamun, and he has the contract for 7,000 poles which are to be furnished at different points along the G. T. P. right of way west of Edmonton. The contract for supplying 2,000 telephone poles for the extension of the Government telephone service in the northern part of the province has been awarded to A. T. Walker, of Lamont. Mr. Walker last week secured the contract for poles, etc., for the Alberta and Great Waterways Railway.

Preston, Ont.

The Canadian Westinghouse and Kilmer & Pullen, agents, General Electric Company, Sweden, McKinnon Building, Toronto, have been awarded the contract by Mr. Yeates, Hydro-Electric engineer for Niagara power distribution. These contracts to be awarded only on the condition that the money by-law to grant the $18,000 necessary is carried. Voting takes place in about three weeks.

Verdun, Que.

Watson, Jack & Company, 109 Power Building, Montreal, have secured the contract for the supply of boilers for the new power plant here manufactured by the Polson Iron Works, known as the "Heine" safety water tube boiler.

Miscellaneous

Belleville, Ont.

The ratepayers have voted to raise funds for the purchase of a new fire engine.

Halifax, N.S.

At a meeting of the Board of City Works the estimates of the department for 19010-11 were adopted. They include:—Cleaning paved streets, $5,500; streets, $25,000; internal health, $17,000; lighting streets, $23,800.

Tenders addressed to C. E. W. Dodwell, resident engineer, Public Works Department, this place, will be received until January 15th for the supply and delivery on the Government pier at Digby, N.S., of about 97M. feet b.m. Georgia pine on or before the 15th of March.

Montreal, Que.

Plans have been prepared for the ice palace, and it is stated tenders will be invited shortly.

The three storey block owned by J. A. Aumais, 2069 St. Lawrence boulevard, was destroyed by fire on the 2nd inst. Estimated total loss, $10,000.

Moncton, N.B.

The New Brunswick Petroleum Company have discovered natural gas in large quantities twelve miles from here, and it is proposed to lay pipes to Moncton.

New Westminster, B.C.

Tenders have been opened for the proposed new incinerator. Richard Taunton, of Winnipeg, agent for the Heenan & Froude patent incinerator, made in Manchester, England, gave three or four prices for different varieties of the machines, and did not go into details. The other bid, by a Portland company, was for $18,468. Its incinerator had a capacity of fifty tons every twenty-four hours. After some discussion a committee of Alderman J. Carter Smith and City Engineer Blackman was appointed to see Mr. Booth, who has charge of the Vancouver plant, to look over the situation here and obtain his advice on means of disposal of the city's garbage.

Ottawa, Ont.

It is believed that Hon. Mr. Brodeur, when bringing down the naval bill on January 12, will definitely announce that the ships of the proposed Canadian navy will be constructed in Canada, for which tenders will be called in Canada. Two offers from British shipbuilding firms—Harland & Wolff and associate interests, and Swan & Hunter, have been received. The former proposition, as previously stated, was regarded as asking too much. The latter firm's representatives have had interviews with the Minister of Marine, and a third British firm is also in communication with the Government respecting the subject. The Government has positive assurance that bids will be forthcoming from reputable shipbuilding concerns in Great Britain, who are willing to start branch establishments in Canad a.

Regina, Sask.

A programme has been prepared by the Public Works Committee involving the expenditure of half a million dollars on public improvements for the coming year, which includes trunk sewer, $363,000; pavements, $113,000; and sidewalks, $113,300, and Albert street subway, $50,000.

Victoria, B.C.

It is stated that a new stern wheel steamer for the Skeena river trade will be built this winter. It will be put into commission by a new company of Vancouver capitalists. Captain Bucey is interested. Contracts will be called shortly. Estimated cost, $40,000.

AWARDED.

Halifax, N.S.

At a recent council meeting tenders for 10,000 brick were opened. The General Contractors' Supply Company tendered at $7 per 1,000 at the depot or $7.50 at the Cotton Factory Siding. J. Simmonds & Company at $6.95 at the depot and $7.25 at the Cotton Factory Siding. The latter was accepted.

Toronto, Ont.

The Polson Company, Toronto, have secured the contract for the new ferry boat to cost $80,000.

New Companies

Cassiar Construction Company, Limited, Toronto, Ont., incorporated, capital $20,000. Incorporators, J. S. Lovell, W. Bain and R. Gowans, all of Toronto, Ont.

Temiskaming Lumber Company, Limited, Toronto, Ont., incorporated, capital $75,000. Incorporators, G. H. Kilmer, J. A. Andrew and W. H. Irving, barristers, all of Toronto.

Thedford, Arkona & East Lambton Telephone Company, Limited, Thedford, Ont., incorporated, capital $10,000. Incorporators, A. J. Grant, physician, W. N. Ironside, hardware merchant, both of Thedford.

Lafrance Improved Pipe Joints Company, Limited, Montreal, Que., incorporated, capital $50,000. Incorporators, A. Chagnon, general contractor; L. D. Latour, real estate agent, and J. Medard Guindon, merchant, all of Montreal.

Universal Engineering & Manufacturing Company, Limited, Montreal, Que., incorporated, capital $95,000. Incorporators, J. J. Campbell, J. D. Lachapelle and J. C. Dudley, electrical engineers, all of Montreal.

Suggestions on Oiling Macadam

At a meeting of the California League of Municipalities, V. M. Frodden, street superintendent of Alameda, Cal., gave the following directions for oiling macadamized streets, as the result of several years' experience.

The preliminary step, and one on which he lays great stress, is to clean the macadam thoroughly. He cleans the gutters and sweeps the street as free as posisble of all loose dirt and dust. Then the oil is spread as lightly as possible, but in sufficient quantity to cover the surface thoroughly. We quote as follows:

There is more danger in getting too much oil on the street than not enough, as all that is necessary is to cover the surface evenly and not leave any dry spots.

I oil only one-half of the street at a time, unless all travel can be shut off it, and immediately after oiling I cover all crossings and driveways with [illegible] screenings, thus preventing the oil from being picked up by vehicles. I am very careful to use only the cleanest screenings, as sand and dirt work very badly on the oil. The time taken for drying is owing entirely to the amount of sun or shade that the streets gets. In the sun it generally takes about two weeks.

I have had the best oil from the Associated Oil Company. It is from 17 to 18 gravity and contains about [illegible] asphalt. It must be heated in the car to about 200 F. by means of live steam before pumping into the distributor.

On old macadam roads I find that I can cover from 500 to 600 square feet per barrel of 42 gallons. On new macadam roads, oiled before any travel has been on them, it will take double the amount, as the oil penetrates very quickly and deep. On streets that have been previously oiled it will take considerably less, a barrel covering from 800 to 1,000 square feet.

In making repairs to depressions or chuckholes, I find by experience that it will not do to put too much oil in and fill up the hole with screenings, as the tendency is to shift and bunch up. The best way, I find, is to square the edges of the chuckhole, then fill in with some clean rock, concrete size, cover that with oil and then cover the oil with about one inch of clean rock screenings, all to be well tamped in during construction.

I have oiled all the improved streets in Alameda once and some of them a second time, in my opinion oil being the only present protection against the destructive wear of automobile traffic. The oil will last from two to five years, according to the amount of travel and according to the winter conditions, long continued wet weather being rather trying to oiled streets.

It is not necessary to sprinkle the streets when oiled, the saving of water being one of the best results of oiling. The dust is laid by it and the road may be swept, if need be, like an asphalt pavement with a sweeping machine.

Cost of Small Concrete Houses

The use of concrete for small buildings presents a vast field for operation. Its use for larger buildings has proven its efficiency, and is attracting the attention of men interested in the building of homes. The question of cost is naturally of great importance to such men. Frame construction is of such a character that its cost has a considerable range, depending on the manner in which it is put up, but a first-class frame house will cost more than concrete.

Brick construction will cost for a 13-inch wall from 36 cents to 50 cents per square foot of wall, and a 9-inch wall will cost from 25 cents to 35 cents per square foot of wall. To these figures must be added, for the finished wall, cost of furring, lathing and two brown or scratch coats of plaster and the white coat.

Hollow tile construction, which has an advantage over brick, by reason of its air space, averages about the cost of brick or a trifle under.

The cost of block construction is from [illegible] square foot of wall, having a thickness of 8 to 12 inches, inclusive. For the finished wall and the cost of the white finish coat, which is put directly on the concrete, thus saving the cost of furring, lathing and plaster.

A hollow, reinforced concrete wall will cost from 15 cents to 25 cents per square foot of wall, plus the finish coat.

A 6-inch wall, with furring, lathing or metal sheathing, [illegible] cents per square foot for the concrete, plus the furring, lathing and plaster.

Two-inch partitions will cost 16 cents [illegible] but little more than wooden shingles.

Properly constructed, [illegible] opinion, find ready acceptance when it is realized that they are permanent, fireproof, [illegible] Architect and Engineer.

Tenders and For Sale Department

Tenders for
Steel Substructure for Louise Bridge

Sealed tenders addressed to the Chairman, Board of Control, [illegible] the office of the undersigned [illegible] TUESDAY, JANUARY 18th, 1910, for [illegible] the present superstructure and furnishing and erecting new superstructure and floor complete for Louise Bridge across the Red River. Plans, specifications and forms of tender together with conditions governing tenders as prescribed by by-law, may be seen at the office of the City Engineer, Winnipeg. The lowest or any tender not necessarily accepted.

M. PETERSON.
Secretary.

Board of Control Office,
Winnipeg, Canada, Dec. 8th, 1909. 1

Electrical Machinery for Sale

Two 120 k.w. Single Phase T. & H. Alternators, 25 Cycles, 2,000 Volts, complete with exciter, switchboards, etc. One [illegible] k.w. Direct Current Generator, 550 Volts, complete with switchboards, etc. A number of 550 Volts D. C. Motors, of various sizes and types. 3 Arc Machines, 10, 20 and 35 light capacity, respectively. 16 Arc Lamps nearly new. One waterwheel about 200 h. p under 30 feet head, complete with shaftings, boxes crown gear, pullies, belts, etc., also endless belts, friction pullies, etc. All of the above machinery in first-class operative condition and most all in operation at present time. Will be sold for future delivery at a sacrifice. Machines may be seen in actual operation Price and further information given upon request to The Superintendent, Electrical Department, Coaticook, Que. 2

Tenders

Sealed tenders endorsed "Tender for Sewage Tanks" or "Tenders for Valves" etc. as the case may be, will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, until noon on FEBRUARY 15TH, 1910, for the following work and materials:

Contract No. 3. Laying Sewer Outlet.
4. Building Sewage Tanks.
5. Supply of Iron Castings.
6. " " Structural Steel.
7. " " Sludge Valves, Penstocks and Pedestals
8. " " Cast Iron Pipe.
9. " " Cranes
10. " " Special Tile.

Plans may be seen and specifications obtained at the office of the City Engineer, Toronto.

The usual conditions relating to tenders as prescribed by City By-law must be strictly complied with or the tender will not be entertained.

The lowest or any tender not necessarily accepted.

JOSEPH OLIVER (Mayor)
Chairman, Board of Control.

City Hall, Toronto, December 14th, 1909. 1

City of Wetaskiwin, Alberta

Sealed tenders will be received by the undersigned up to FEBRUARY 15TH, 1910, for the drilling of a Gas Well in the City of Wetaskiwin, at so much per foot.

A certified cheque for $500.00 must accompany each bid.

The lowest or any tender not necessarily accepted.

Specifications and form of tender may be received from

E. ROBERTS,
Secretary-Treasurer

2

Notice to Contractors

Piling for Wilton Avenue Bridge

Tenders will be received by registered post only, addrrssed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on TUESDAY, JANUARY, 18TH, 1910, for the supply of timber piles and driving of same for the bridge on the extension of Wilton avenue crossing over the River Don.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications may be seen and forms of tender obtained at the office of the City Engineer, Toronto.

The usual conditions relating to tendering as prescribed by City By-law must be strictly complied with or the tenders will not be entertained.

The lowest or any tender not necessarily accepted.

JOSEPH OLIVER, (Mayor),
Chairman of Board of Control.

City Hall, Toronto, December 31, 1909. 1

Resisting Power of Building Materials

Some interesting tests were made recently in the fire underwriters' laboratories in Chicago of the fire resisting qualities of various building materials. The tests were made by the United States Geological Survey.

The materials were subjected to two hours of heat and were then exposed to a stream of water. The report says the trials were unusually severe and that not one of the different kinds of material passed perfectly, but the temperature to which they were subjected was greater than that to be expected at any ordinary fire.

One of the principal points demonstrated was the low transmission quality of Portland cement, mortars and concretes. Brick sustained the test the longest and showed the greatest resisting powers. Fifty per cent. of the new brick split while from sixty to seventy per cent. of the old brick were not damaged. The hydraulic pressed brick proved to be better than the sand and lime variety. The various natural building stones were so seriously damaged that no comparative figures were made.

Such severe tests as these are valuable chiefly in establishing a standard for the manufacture of building material to work to. Cement which showed such low heat transmission qualities in these tests was the very thing that stood best in the San Francisco fire, the fire that put all building materials to the greatest test in actual experience.

Along with the publication of this report there comes a story from Pittsburg of the destruction of an office building erected in modern steel construction twelve years ago. This was the first of the big steel frame structures in the country to be dismantled, and it was torn down only to make room for a larger and more modern building. This has proven the claims of the steel men as to the durability of this kind of building. The material is reported to be in just as good condition when uncovered to the elements as it was when it was erected twelve years ago. The rivets were tight and even grillage upon which the beam columns rested, and which were under the ground, was in perfect condition. This same material will be used again in the construction of another office building in a different section of that city.

The Use of Calcium Chloride to Prevent Freezing

Any one familiar with the action of cement in setting knows that this hardening is due to a crystallization of the component salts of the cement, silicates, alumnides, etc.; and for this hydration and crystallization it is patent that the presence of water is absolutely necessary, says Concrete. In running concrete in the field when the temperature is below the freezing point of water, the problem met with is the difficulty of keeping the water in the concrete in a liquid state until after the initial set has taken place. In other words, in the language of the field, to "keep the concrete from freezing." There are two radically different methods of securing this result. One is to so heat the water, the sand and the aggregate, that the concrete retains enough latent heat to keep above the freezing point until after the concrete can take its initial set.

Another method is to so lower the freezing point of the water by the addition of salt that it can be taken up by the cement in crystallization before it freezes.

It is a well known fact that solutions of calcium chloride freeze at a lower temperature than solutions of common salt (sodium chloride). Experiments show that a 20 per cent. solution of common salt freezes at 7 degrees F., while the same solution of calcium chloride freezes 8 degrees lower, at —1 degree F.

In experiments recently conducted at one of the eastern laboratories, numerous briquettes were made, some with water gauged with common salt, others with water gauged with calcium chloride, and others with clear water. These briquettes were exposed to the most vigorous climatic conditions, in every way possible stimulating the field, and in every case the briquettes in which the calcium chloride was used, showed up the best under tests.

In the very nature of the case, the calcium element should be a valuable addition to the composition of cement. French experiments have proven that the addition of this compound improves the quality of the cement, relative to time of setting, waterproofing and other qualities.

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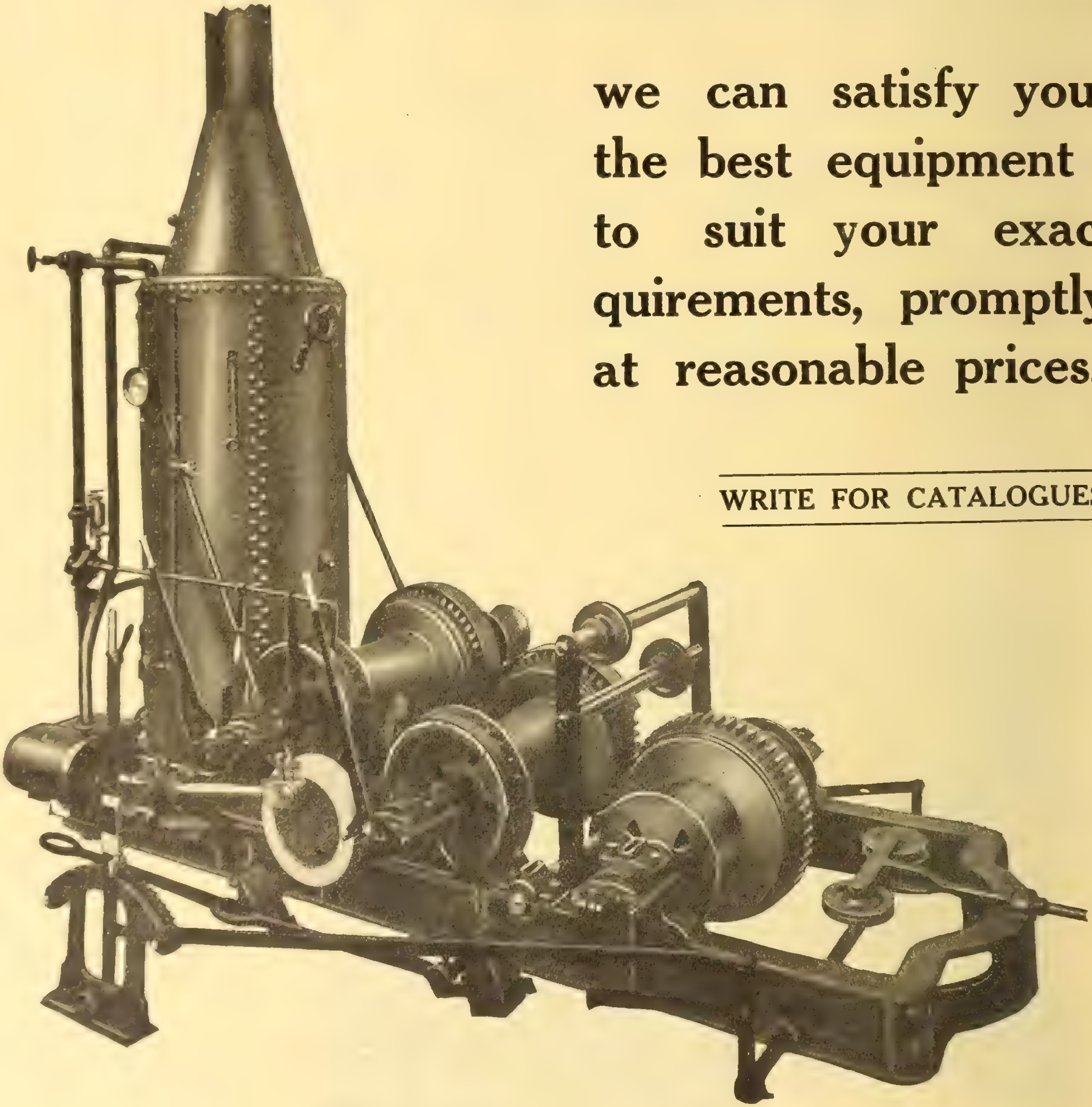

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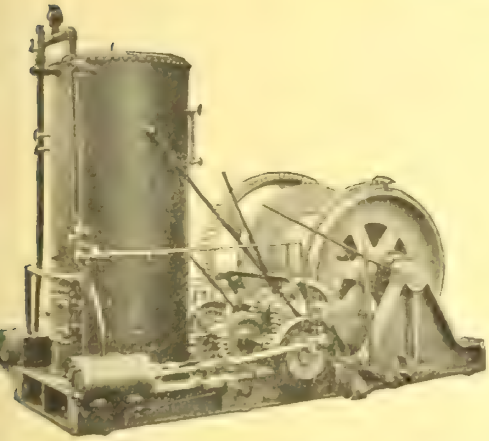

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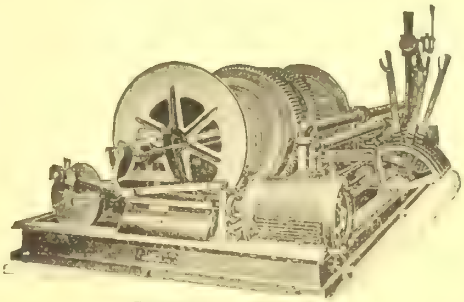

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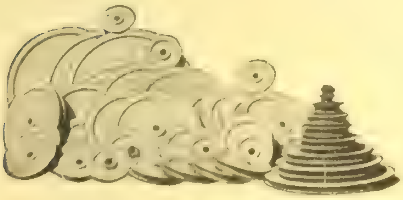

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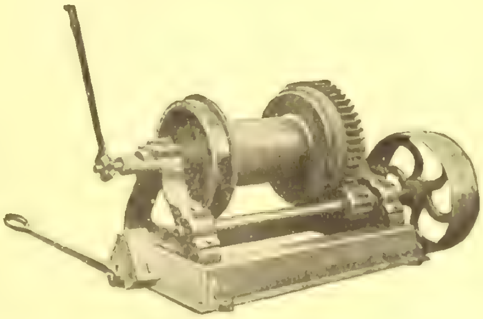

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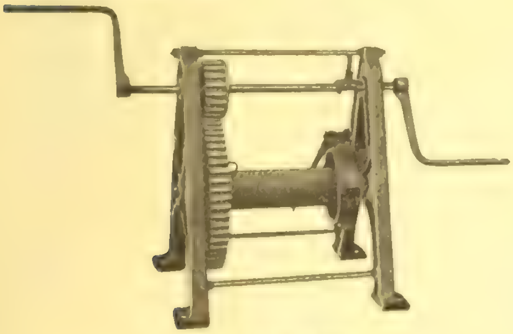

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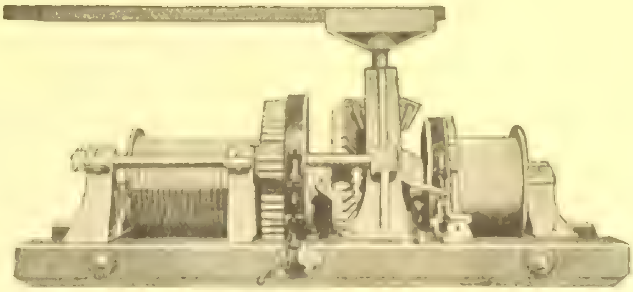

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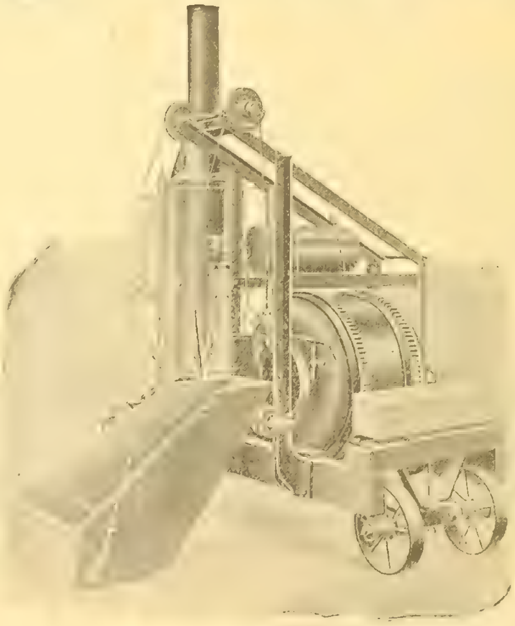

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New Year Reflections

"There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune."

With this issue we enter upon the work of another year. Nineteen hundred and ten is before us. According to the measure of our confidence and enterprise, so we shall be recompensed during the next twelve months. The most optimistic predictions for 1909 were fulfilled. With a practical show of enthusiasm and aggressiveness the brightest forecast for 1910 will be away behind the mark, and if we have not raised ourselves to a higher plane of prosperity by the end of the year we shall have been unworthy of our citizenship.

⁂

Here in Canada we have the goods. There is no question about that. Our part is to watch for the tide at its flood and to learn how to make the most of our God-given opportunities. If Shakespeare had lived in this age and visited Canada he would have been inspired to greater things than he ever accomplished in mediaeval England. Nevertheless, the familiar lines of the great bard may provide food for reflection at this time. The "Contract Record" wishes all its friends a right prosperous New Year. May the developments of 1910 redound to the success of us all!

Inconsistencies of Law Courts

The inscrutable workings of the legal mind and the apparent inconsistencies of the law courts have provided for many a long day a fertile source of inspiration for the humorist and for the unenlightened layman, a byword for many a joke—of the latter as well as the palatable variety. Those who have never been concerned very much with litigation and who, consequently, are on the outside track in regard to legal matters may well congratulate themselves upon their position. Often, when a man goes to law, having what he believes to be a strong case, he finds himself brought by the intricacies of the game to the old issue, "Heads I win, tails you lose."

⁂

In the case of an engineer (reported elsewhere in this issue), who was endeavoring to secure what he considered complete and proper payment for services rendered, judgment was given against him owing to the provisions of the Municipal Drainage Act, which were admitted by the court not to be in accordance with the dictates of reason. The conclusion of the finding was framed as follows. "Much as I regret the result, it is in my view inevitable. The Legislature has in effect determined that an engineer employed under the Act is not to be paid what his services are worth, but what the County Judge thinks they are worth. The appeal must be quashed."

⁂

This might appear to be a piece of exceptionally hard luck, but in reality it is not so. History repeats itself. Ever since legal proceedings were instituted, there have been decisions of this kind. The letter of the law and legal technicalities have come into occasional conflict with justice ever since the old fashioned methods of trial by combat or ordeal gave way to the more tranquil but almost as unsatisfactory proceedings of the courts. There is a moral in this. The law is to be avoided rather than courted. If there is one vulnerable point in a man's case, it is far better for him to be content with what he can obtain by his own wits—outside the courts.

Education of the Engineer

One not infrequently hears complaints from engineers regarding the insufficient respect and wages paid the members of their profession. The explanation of the treatment, it seems to us, lies not in the profession, but in the men. When engineers receive and assimilate the same education that is commonly found in physicians and lawyers, their profession will be accorded an equal standing in the popular mind. Too many students of engineering make no effort to obtain from their educational opportunities anything but engineering information —not even spelling or literary expression. In a single examination students of an engineering college were guilty of the following: Verticle line; either to short or two long; subsiquent ware (subsequent wear); crust (crushed) stone; typographical survey.

⁂

It would seem that a regular college course should precede technical training. There can be no question that such a step would help to raise the profession in popular estimation, and would assist in increasing the number of educated engineers. Many young men, it is argued, cannot afford to spend two additional years in obtaining an education; but the same is equally true of students of law or medicine. Even admitting this argument, a great deal would be gained if the young men and students of the profession could be persuaded that their own personal standing in their communities and that of the profession at large would be greatly advanced if they would be as particular in their use of language as in the foundations of their engineering structures; careful to express themselves as clearly in words as in drawings, and [illegible] of the [illegible] that the respect accorded to them by the community at large will be based less upon their work than upon their personality.

Cobalt's Waterworks and Sewer Systems

Details of timely and important improvements under way in the Silver City—Constructive difficulties encountered in early stages

Specially contributed by H. W. Sutcliffe, O.L.S.

As Cobalt is situated practically in the centre of one of the richest silver mining camps of the world, a stranger would first think of it as being a somewhat rough and rocky place; and after having paid the town a visit, he would be in no way disappointed so far as those characteristics are concerned. The rich silver bearing part of the camp covers approximately five square miles, so that the town could really be said to cover the whole camp. What is considered, however, the town proper, lies to the west of Cobalt lake and covers parts of mining properties owned by the city of Cobalt, Buffalo, Coniagas and Nipissing Mining Companies. The main part of the town covers less than one hundred acres, and in this space about 6,000 people are accommodated. Houses are not only built fronting on the streets, but in many places on the lanes.

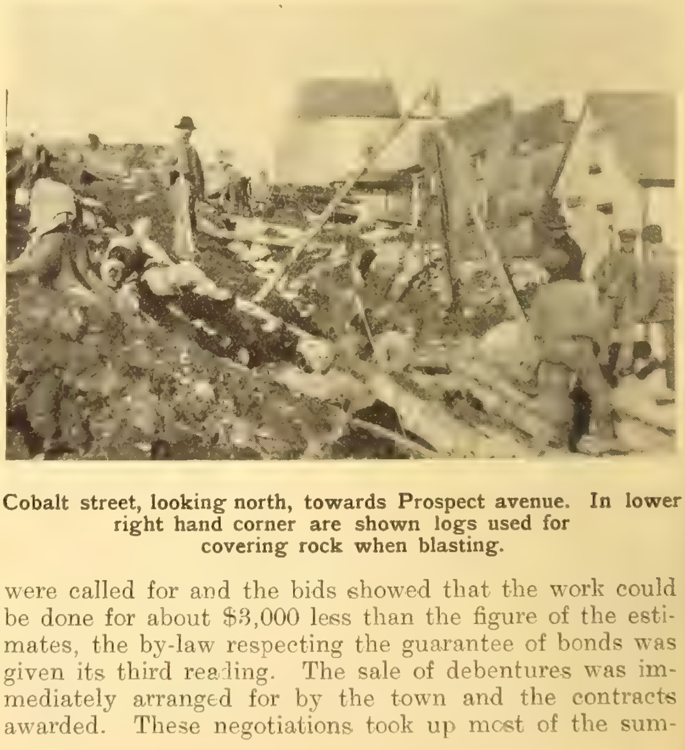
A portion of the contractors' plant on Prospect Avenue. In the centre of the picture is shown one of the six steam drills used in the work.

The writer first saw Cobalt in the spring of 1905. At that time the railway station buildings were not built, and excepting a few log shacks and tents, there was very little evidence of a town. However, during this same year, owing to the great number of people coming to the new mining camp (many of whom were building along the west shore of Cobalt lake), the Government found it necessary to lay out the present townsite. Thus, phenomenally, in less than five years, the town has grown to what it is to-day. It is estimated that in the town of Cobalt five times more business is done daily than in any other town of the same population in Ontario. It is only due to the fact that the space allotted for building is very limited that the town is not twice the size it is. Instead, people do their business in Cobalt during the day and live the remainder of the time in other towns. Haileybury is the nearest town, and it being only five miles distant from Cobalt, many find it preferable to keep their families there. Others go farther north, to New Liskeard.

In the year 1907, the question of water supply presented itself, and the installation of a waterworks system was proposed. However, organization in the town was not yet perfected, and, besides, Cobalt being but a young mining town, it was considered too much of a venture by many, and as a result the matter was dropped for a time. In 1908, the question again arose, and to overcome the difficulty of placing debentures, the Provincial Government was asked to authorize the township of Coleman to guarantee bonds for the town of Cobalt to the extent of $75,000. This was passed accordingly, but it was in March, 1909, before any definite step was taken. The engineering firm, Sutcliffe & Neelands, of New Liskeard, Ont., were asked to make estimates for both a waterworks and sewers system. They, with the assistance of Mr. O. W. Smith, of Messrs. Galt & Smith, consulting engineers, Toronto, estimated that the systems without filters could be installed for $73,800.

The Provincial Board of Health had already approved of Clear Lake, which is about a mile west of the town, as suitable for a source of water supply, but as Sasaginaga lake was a larger body of water and not over half a mile distant from the town, efforts were made to obtain their approval of the water in this lake, the main object in this being to reduce the expenditure as much as possible. This was eventually obtained, but on condition that filters be used, as the water in this lake contained considerable quantities of algae.

Considerable difficulty was experienced in getting the council of the township of Coleman to submit a by-law authorizing the guarantee of the above bonds, as it was generally believed that the work could not be done for anything near what the estimates called for. However, it was eventually given its first and second reading in the council, and put before the people. After tenders were called for and the bids showed that the work could be done for about $3,000 less than the figure of the estimates, the by-law respecting the guarantee of bonds was given its third reading. The sale of debentures was immediately arranged for by the town and the contracts awarded. These negotiations took up most of the sum-



Cobalt street, looking north, towards Prospect avenue. In lower right hand corner are shown logs used for covering rock when blasting.

mer, and it was not until the latter part of August that the contracts were awarded.

In the meantime, the town was so much in need of water that it was necessary to put in a temporary system. This was laid on the surface of the ground, and consisted of a six-inch main and a four-inch distribution system. A 200-gallon Deeming triplex pump forces the water from Sasaginaga lake to a small standpipe placed on one of the hills within the town limits.

The installation of the permanent systems is a somewhat difficult one, owing to the fact that most of the excavation is in a conglomerate rock of the Huronian formation—a very hard and difficult rock to work. Also, the town is so thickly settled that great care has to be exercised in blasting. A system of sewers has been designed to accommodate practically the whole town, but as the physical features are so irregular, there are a few places where mechanical means will have to be adopted to take care of the sewage. The cost of rock excavation is so great that deep cutting is not warranted The water pipes are placed six feet below the surface. The sewers are from 6 to 8 feet deep, and in one instance run 16 feet below street grade.

Prospect avenue looking east. The main part of the town is below the hill on top of which the contractors' boiler may be seen.

It is not yet finally decided which of Clear and Sasaginaga lakes will be the source of water supply. Before installing a pumping plant, it was considered advisable to make a study of the water in both lakes during the summer season. Meantime, water was pumped from Sasaginaga lake into the temporary system. As only a small portion of the system was installed last fall, the pumps used on the temporary system are being operated during the winter. The water of Sasaginaga lake, as said before, contains large quantities of algae, and will require filtering. It is only during the summer months, however, that the algae occurs in large quantities, so that, in the event of using this water, sand filters will be quite sufficient.

A steel standpipe, 25 feet diameter and 50 feet high, is to be erected. When full this will give a pressure of approximately 120 pounds per square inch in the lower part of the town. It is also necessary to treat the sewage, as the effluent from the system must flow onto mining properties and some residential districts. This is being done by means of septic tanks and percolating filters.

The installation is being made by William Newman & Company, of Winnipeg, Man., and under the direction of Mr. H. C. French, vice-president of the company, good progress has been made. Water was delivered in the centre of the town about the middle of last November, but despite the satisfactory progress made on the work last season, the resumption of activities in the spring will find plenty ahead. It is hoped to treat of later phases of this work and to furnish interesting data on constructive features in a future number of the "Contract Record."

Conventions for 1910

The National Brick Manufacturers' Association will hold their annual convention at Pittsburg, Feb. 7-12. Mr. T. A. Randall, Indianapolis, is secretary.

The annual meeting of the National Association of Cement Users will be held in Chicago, Feb. 21-25. Communications should be addressed to E. E. Krause, Harrison Building, Philadelphia, Pa.

The annual meeting of the Canadian Society of Civil Engineers will be held at Ottawa, Ont., January 25-27. For further particulars address Mr. McLeod, secretary, 413 Dorchester street west, Montreal, Que.

The American Society of Engineering Contractors will hold their annual convention at Chicago, Feb. 24-26. Full particulars may be obtained from the secretary, Mr D. J. Hauer, Park Row Building, New York City.

The annual meeting of the American Society of Heating and Ventilating Engineers will be held in New York City on Jan. 18-20. For particulars address the secretary, W. H. MacKay, P.O. Box 1818, New York City.

The annual convention of the American Society of Inspectors of Plumbing and Sanitary Engineers will be be held at Trenton, N.J., Jan. 20-22. Full particulars may be obtained from C. S. McCosker, secretary, Mobile, Ala.

The annual convention of the American Society of Civil Engineers will take place in New York City, Jan. 19-20. Communications should be addressed to the secretary, Mr. Chas. W. Hunt, 220 West 57th street, New York City.

The annual convention of the Ontario Association of Architects will be held in the association rooms, 96 King street west, Toronto, on Tuesday, Jan. 11th. and Wednesday, Jan. 12th. On the former day various routine business will be transacted. In the evening the annual banquet will be held. The agenda for Wednesday include a paper, entitled "Architectural Education in Canada," by Prof. Nobbs, of McGill University, Montreal, and also a paper, entitled "Architecture and its Relation to Art," by John M. Lyle, Toronto. The following are the nominations for three members of council for 1910, 1911 and 1912: John E. Belcher, Peterborough; Edmund Burke, Toronto; Frank Darling, Toronto; C. J. Gibson, Toronto; Alfred H. Gregg, Toronto; James Mather, Ottawa; Colborne P. Meredith, Ottawa; Laurence Munro, Hamilton; A. E. Nicholson, St. Catharines; W. L. Symons, Toronto; Jules F. Wegman, Toronto; J. J. Woolnough, Toronto; Prof. C. H. C. Wright, Toronto.

At Hamilton, Ont., during the past year, additions were built to 33 factories, at a cost of $110,150. Eleven new factory buildings were erected at a cost of [illegible]

Problem of Sanitation in Towns and Cities

Brief Criticism of Septic Tank and other Methods — Land Treatment of Sewage—Principles of the Biological System

By T. Aird Murray

Sewage and water purification have, during the last [illegible] years passed through an evolutionary period. The two subjects are closely related. Sewage contamination to a large extent provides the most objectionable impurities usually found in water. There are certain diseases which are recognized as capable of being water borne; such as typhoid, dysentery, cholera, etc. On the other hand, there may be impurities connected with water which are organic and may have nothing to do with sewage contamination. Two distinct public duties are now recognized in order to guard health from the evils of impure water; one, prevention in the first instance, or the guarding of water supply sources from pollution; and the other in taking proper measures to remove and counteract any pollution, either organic or inorganic, in the water before serving it out to the public.

Full of Organisms

The problem of prevention comprises the subject of efficient sewage disposal. Wherever one or more persons locate, sewage is a necessary product.

Domestic sewage, as well as containing effete poisonous organic matters, is charged with innumerable microscopic organisms to the number of from 30 to 40 million per thimbleful or cubic centimeter. Many of these organisms are known to be harmful, and are the effective carriers of the infection of disease.

Canada in one respect is in a fortunate position inasmuch as it can profit by the experiences of other countries and the great amount of experimental and research work done.

Many old pre-conceived theories with reference to sewage disposal have received their deathblow. Chief among these is the well known and well advertised septic tank.

Septic Tank Experiments

At one time, advocates of the septic tank held that it solved the sludge question, inasmuch as all the organic solids were digested by putrefaction. The Royal Commission, by extensive experiment at the parent septic tank installation at Exeter, have shown that not more than 25 per cent. of the sludge is thus got rid of, while other authorities put the putrefaction elimination as low as 6 per cent.

It was also held that zymotic germs were killed by septic action. Nothing of the kind happens. The effluent from a septic tank is bacteriologically as impure as the sewage entering it.

The germs are changed into putrescible inorganic forms by a process of nitrification, by which organic nitrogen is oxidized to nitrates and nitrites. This is the natural process which takes place in soils, by which organic effete matter is rendered into forms suitable for the rebuilding of plant life.

Land Treatment of Sewage

The process of nitrification is connected with the presence of oxygen and micro-organisms and may take place either in ordinary soil or in specially designed biological filter beds.

By allowing sewage to run over land of an open and friable nature, the sewage gradually percolates into the sand, the organic matter is absorbed by the soil in the upper layers and is then gradually oxidized or nitrified.

"Broad irrigation" and "intermittent filtration" are the two recognized methods of land treatment.

Broad irrigation simply means using the sewage for irrigation purposes on crop lands and distributing it by means of ridges and furrows. Intermittent filtration means the employment of land devoted solely to sewage disposal apart from any crop consideration, the land being divided into lots, which alternately receive a dose of sewage, thus giving time for the liquid to pass out of the soil pores, for the admission of oxygen, higher nitrificat, and a possible maintenance of equilibrium as between retention and oxidation.

When land is resorted to as the purification medium, the system of intermittent filtration provides the greatest measure of success. The continued success depends, however, entirely on the suitability of the land.

The Biological System

Hence the biological system of sewage purification. This system makes sewage purification independent of the character of the land; all that is required is a solid base on which to build simple structures, ideal homes built for the propagation and maintenance of the nitrifying and other organisms, homes or filter beds, if you like to so call them, in which under proper conditions and management the equilibrium between retention, absorption and oxidation can be successfully maintained.

Any degree of purification required can be obtained It is, however, a question of reasonable purification and of cost.

The success of the system depends upon the following essential features:

(a) Preliminary treatment for removal of as much of the solids from the sewage as possible.

(b) Secondary treatment of passing the sewage through filtering media about walnut size. The depth of the media should not be less than 3 feet, and it is unnecessary to have it more than 8 feet.

Such a biological system will so chemically change any ordinary sewage that it is no longer sewage. The effluent will be non-putrescible.

The biological method or the land intermittent filtration process will greatly reduce the number of B. Coli. and other bacteria.

A further reduction is effected by the retention of organic solids in suspension and organic solids in solution absorbed in the filter to the amount of about 85 per cent. of the number entering the filter. So large, however, is the original bacterial count, that the resultant percentage is still in a proportion to render the non-putrescible effluent unsafe for dietetic purposes unless mixed with a large volume of pure water. The life of the resultant bacteria, an effluent practically free from organic matter and thoroughly oxidized, is very short.

It therefore cannot be denied that although it is absurd to speak of nitrified sewage as potable water, a great and beneficial work is accomplished.

This nitrified and non-putrescible sewage effluent can be rendered practically sterile if required. The process, however, is in most cases unnecessary.

Contract Work and Day Labor

The City Engineer of Fort William, Ont., Mr. H. S. Hancock, presented to council a comprehensive and interesting annual report, from which are culled the following conclusions in regard to contract work and day labor, and other interesting matters:

"Contract work—With a good contractor and honest capable inspectors, good work can be secured, because the contractor has his personal fortune at stake, and in work of the same calibre as we undertake, he is able to give it personal attention. If the contractor is thoroughly competent, this factor alone makes a considerable percentage of profit over day labor, but seldom sufficient to satisfy the average contractor. If it is sufficient and the two conditions of good contractors and rigid inspection be fulfilled, contract work is a success. The main features to be watched by council are: (1) That the contractor is thoroughly reliable and efficient, seldom the lowest bidder in the average small city; (2) That inspectors of absolute integrity and with a thorough knowledge of their work are selected.

"Day labor—The same conditions of honesty and integrity are equally necessary in this case, and the success of the policy is greater in accordance with the extent to which these qualities permeate the whole working force. Of course, the plan on which the force is organized and controlled has a most important bearing on the results obtained. This organization we have attempted to improve from year to year, and as the work grows in magnitude and importance further changes become necessary.

"The changes I propose for the coming season, if a day labor policy is adopted, are three in number, and the work has assumed such proportions that I am convinced of their absolute necessity. In fact, they are vital to the success of a day labor policy:

"First—The stores department must be centralized and an efficient store-keeper installed at the board of works yard. Also, the stock books now kept in this office must be kept by him and audited monthly. This man will have full charge of the yard and be responsible for all material. He can also do what small purchasing is left over from the 'calling for tenders' system of purchasing, adopted with complete success during the present year, and, above all, furnish this office with a daily cost record of the material supplied to each job.

"Secondly—The offices of street commissioner and general foreman must be separated. The work is too much for one man, and in any case construction work needs the supervision of a man with scientific, as well as practical, training, or, in other words, a 'cost engineer,' especially so, now that the work has reached such an important stage as at present.

"Thirdly—To make the costs engineer's work effective, a complete system of daily reports on all works in progress, giving daily detailed records of the progress made and the daily cost. This may appear to mean increased cost, but many thousands of dollars can be saved by such an efficient system.

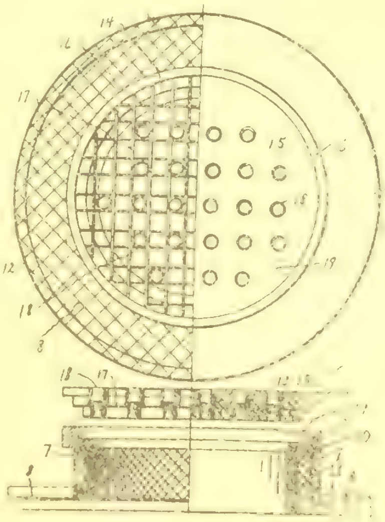
"The above reforms added to those already instituted, should go far towards making day labor work as effective as human nature can make it. I am fully aware that day labor work in the past has not reached perfection, and probably never will do, but in quality of work and reasonableness of cost, it has come a great deal closer to perfection than the major portion of municipal contract work in Fort William.

"The total construction cost of the department during the past year, including sewers, waterworks, street railway, etc., has amounted to over $500,000. I have grave doubts as to the ability of any contractor to do this work at this figure and make 15 per cent. profit, which is the lowest percentage usually figured or made by contractors; in this case, a profit of over $65,000.

"It will be necessary next year to purchase some excavating machinery, but I will defer a recommendation until you have decided on the work to be undertaken. During the past season the sewerage system has been extended 3.32 miles, which brings the total mileage to 20.33."

Concrete Manhole Head

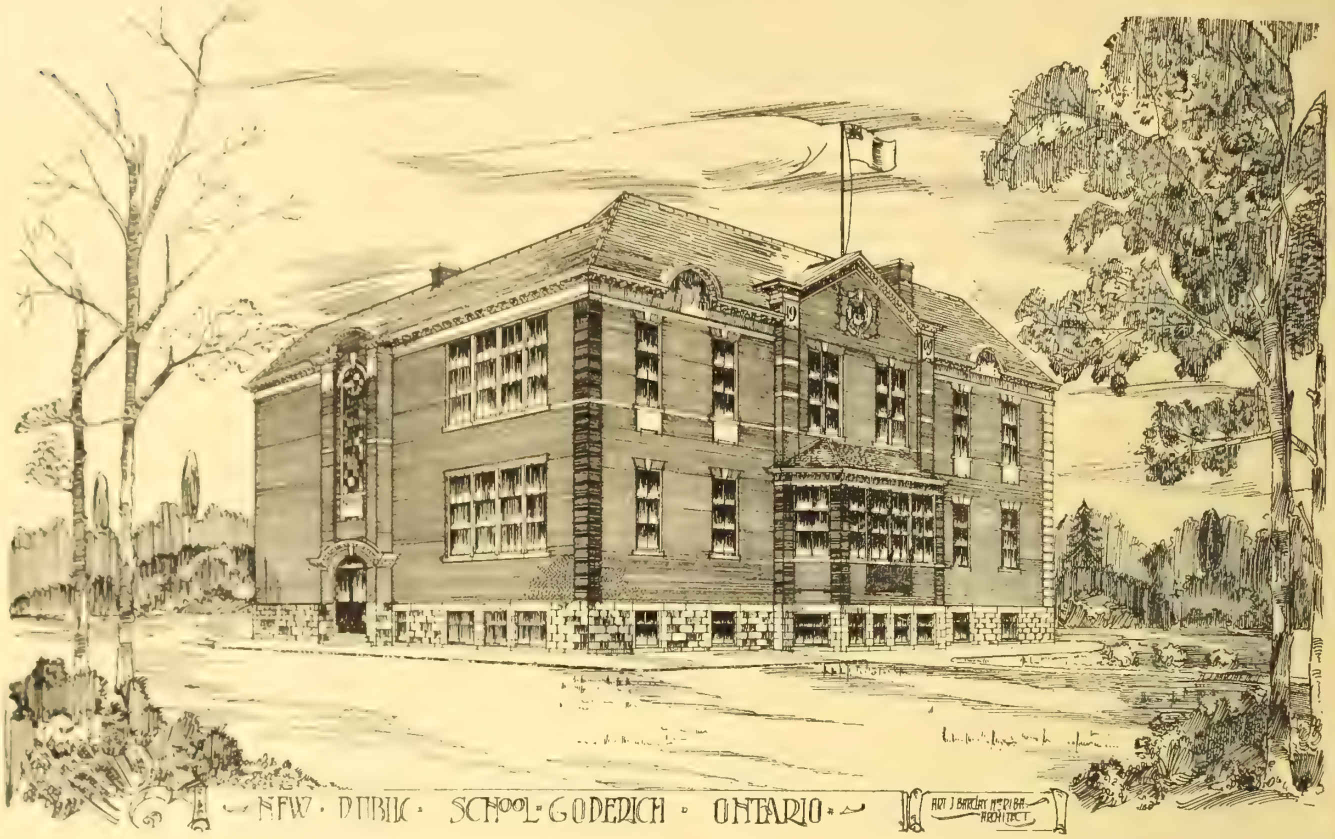
City Engineer John P. Rogers, of Topeka, Kan., has designed a reinforced concrete manhole head which is being used successfully in connection with sewers and other underground structures. It consists of a metal lattice work collar, a metal base and metal rim which form the skeleton of the head, the main bulk being given by concrete for which this forms the reinforcement. The cover is made with an outer protecting rim or shield of iron, showing in section concentric steps. On one of the steps or ledges are laid steel rods to reinforce the concrete which composes the body of the cover. Mr. Rogers states that this design requires but 90 pounds of cast iron as against 350 pounds, the weight of the cast iron heads which have been used in Topeka.



Details of Concrete Manhole Head and Cover.

New Engineer's Club at London, Ont.

At the annual banquet of the S. P. S. London Club, held last week in the Forest City, it was unanimously decided to form a London Engineers' Club, the society to consist of engineers from all branches of the profession resident in the city. The banquet was attended by a large number of graduates and undergraduates of the School of Practical Science, Toronto. Replying to the toast of "The City of London," Mr. E. I. Sifton, City Electrical Engineer, outlined the growth of the city from the time that it had been composed of only one house until the present day. In the course of his remarks he [illegible] the [illegible] of the [illegible] by [illegible] [illegible]. Those present included Messrs. E. I. Sifton, C. Talbot, W. C. Cooper, W. Ferguson, A. C. Spencer, B.A.Sc.; J. A. Stiles, B.A.Sc.; C. Moore, B.A.Sc.; L. S. O'Dell, J. Nash, P. G. Delford, B. Haymen, R. H. Cunningham, F. Brickenden, H. Roblin, W. Lawrence, H. Eckert, L. P. York, C. Smith, W. Kelley, R. Pickard, Mr. Fiddes, H. McKenzie, J. Mc[illegible], C. [illegible] and D. [illegible].


NEW · PUBLIC · SCHOOL · GODERICH · ONTARIO
ART J BARCLAY
ARCHITECT

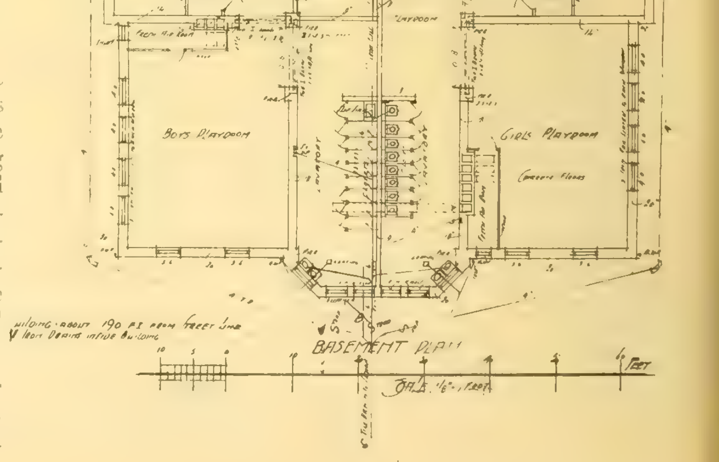
Modern School Building at Goderich, Ontario

Benefiting by past experience, many cities and towns are providing better and safer buildings for educational purposes. Architects are making every effort to meet modern requirements in this class of work, especially in regard to heating, ventilation, light and sanitation, also to location of classrooms to the entrances, to give ready ingress and egress.

The new building illustrated was designed by Architect Arthur J. Barclay, who has had considerable experience of modern school buildings, and who has made a careful study of the work so as to provide an ideal school for the town. The building has a frontage of about 78 feet by a depth of 72 feet, and is two storeys and basement in height. It is kept back from the roadway about 190 feet, so that a fine perspective view can be obtained in approaching it, and which will allow of attractive grounds being laid out in front.

The exterior of the building will present a pleasant effect, with dark red pressed brick and stone foundations and plinth course, with grey stone trimmings. The Classic style of architecture is followed. In designing the building, particular attention has been paid to all the requirements of the board of education. The classrooms are so arranged that six out of the eight classrooms get the most valuable light, viz., south and southeast, and are amply lighted by continuous windows, the seats being so arranged as to give the pupils a left hand light in all classrooms.

Every care has been taken in planning to have the interior arranged along the most hygienic and safe lines. The corridors, hall and entrances are wide and well lighted and ventilated. There are two well located entrances or exits to the ground floor. An effort has been made, both in plans and elevations, to carry out in the most economical manner, and at the same time to give a quiet dignity and imposing effect in the architectural treatment of the several elevations. Considera-



tion has been given to future extensions, provision for which has been made at sides at rear of building.

The basement floor contains amply lighted and ventilated playrooms for boys and girls, with lavatories for each. Simplicity in the plumbing arrangements has been carefully considered. A special feature in the lavatories are the individual automatic closets for pupils. Ample space has been provided at rear of building for fuel and coal, janitor's store and boiler room, and all well lighted. Two spacious staircases have been provided near centre at sides of building for boys and girls, with separate entrances.

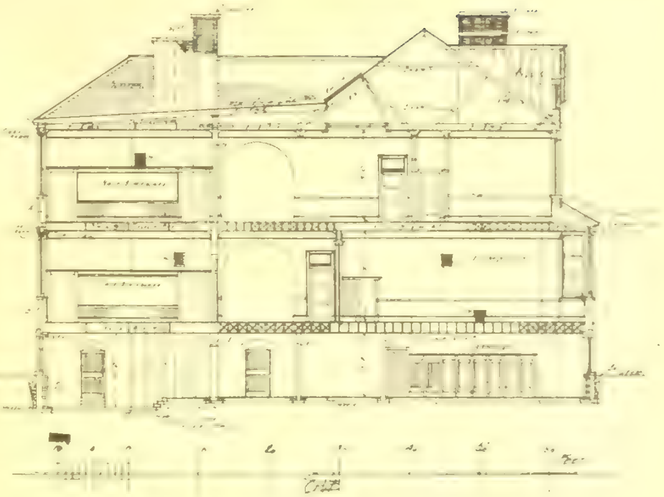
On the ground floor are four well lighted and ventilated classrooms, with cloak rooms to each. A splendid feature on this floor is the large kindergarten, divided from the main hall by sliding glass doors, and which can be thrown into one large room for assembly purposes.

On the first floor are four classrooms, similar to ground floor, also principal's or board room and teachers' room, with lavatories attached.

The heating and ventilating system has been laid out whereby the building will be heated by direct radiation, combined with a system of natural draft ventilation. The system is a one pipe low pressure gravity system. The system of natural ventilation is considered the best for a school building such as this. Under this system the cold air is taken from the outside in basement, is passed through a volumn damper, the air then passing through direct heating radiators into the ducts, and through the registers into the classrooms.

The general layout of the different floors has been arranged to produce a well balanced symmetrical effect, the classrooms being mostly of a uniform size, grouped round a commodious centre hall, the rooms being so arranged as to bring the rays of light only over the left shoulder of the pupil, thus avoiding any possibility of conflicting shadows.

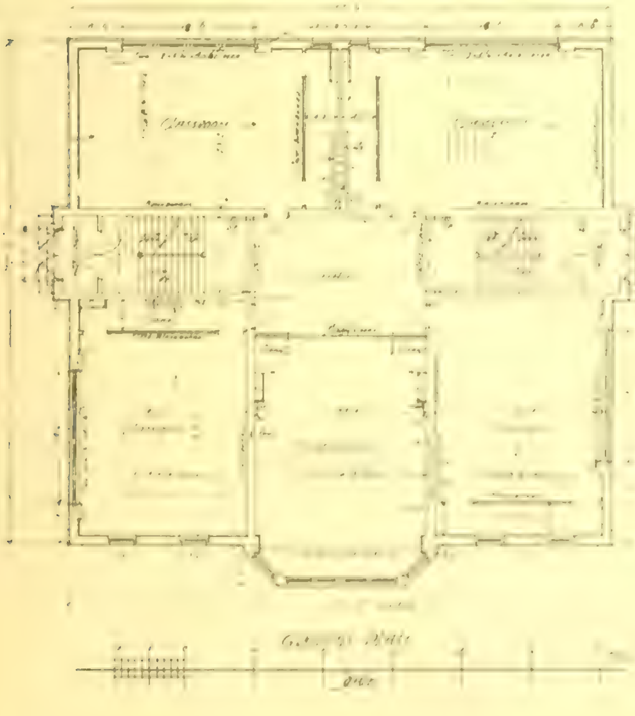
An effort has been made to meet the most modern requirements in the matter of light, heat, ventilation and sanitary equipment, and further, the location of the classrooms and their proximity to the entrances, so as to permit of ready ingress and egress without congestion. Spacious and well lighted and ventilated staircases are provided, these being arranged so as to lead directly to the entrances, the sexes, also, being properly segregated in basement.

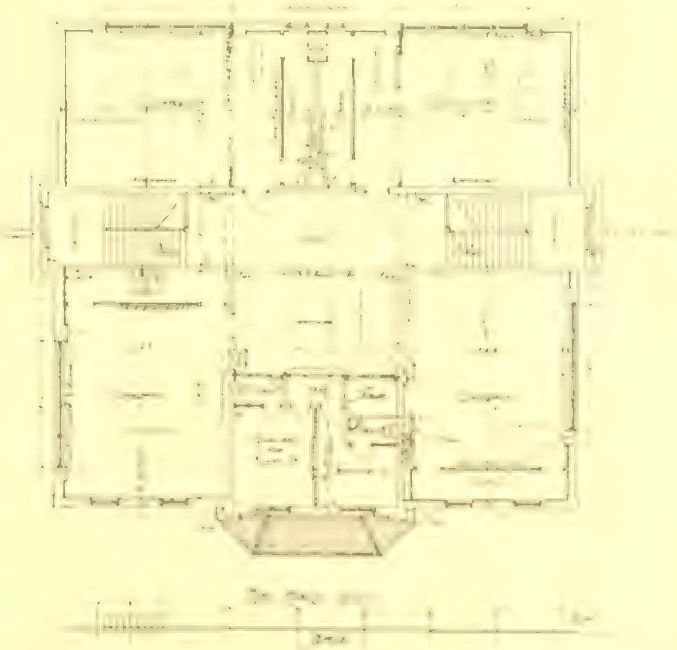


Section.

The various contracts on this building were awarded as follows: Masonry and brick work, C. A. Reid & Company; carpentry and joiner work, Goderich Planing Mills Company, Limited; heating and ventilating, Chas. C. Lea; plumbing and galvanized iron work, Chas. J. Harper; painting, D. Munro; all of Goderich, Ont.

The new Wellington street viaduct at Ottawa was formerly declared open for traffic last week by Mayor Hopewell and City Engineer Ker and members of the city council. Formerly at this point Wellington street was crossed by four tracks, three of the C.P.R. and one of the G.T.R., within a space of 1,000 feet. Some time ago the Railway Commission, owing to the frequency of accidents, ordered a viaduct to be built. Work was commenced in June, the city constructing the approaches and the C.P.R. the actual steelwork. While the bridge is now ready for traffic, there still remain the macadamizing of the approaches and concrete curb on top to be built.





Valuable Data on Building Construction

Loads to which a Structure is Subject—Dead, Live, Snow and Wind Loads—Principles of Tension and Compression

By Paul T. Lesher

One of the first and most important things to take into consideration in the study of building construction is the different kinds of loads a structure is liable to have. These may be divided into three classes; dead loads, live loads, and the snow and wind loads.

Dead Loads on Structures

The weight of the structure itself is the dead load; for instance, the weight of the roof forms a portion of the dead load on the walls and columns; the floors cause a dead load to come on the walls and columns; and then the total dead load of the structure is transferred through the walls and column footings to the supporting soil.

In order to figure this dead load we must know the average weight of the materials, and the following table gives the weights of the most comfon building materials:

WEIGHTS OF BUILDING MATERIALS

White pine,	2½ pounds per square foot, 1 inch thick.
Hemlock,	2½ pounds per square foot, 1 inch thick.
Spruce,	2½ pounds per square foot, 1 inch thick.
Yellow pine,	4 pounds per square foot, 1 inch thick.
Oak,	4 pounds per square foot, 1 inch thick.
Structural steel,	0.29 pounds per cubic inch.
Cast iron,	0.26 pounds per cubic inch.
Wrought iron,	0.28 pounds per cubic inch.
Ordinary soil or earth,	100 pounds per cubic foot.
Brickwork in lime mortar,	120 pounds per cubic foot.
Brickwork in cement mortar,	130 pounds per cubic foot.
Stone concrete,	130 to 140 pounds per cubic foot. Best to use 140 pounds.
Compact cinder concrete,	about 100 pounds per cubic foot.
Light cinder concrete (such as is used in filling),	80 pounds per square foot.
Granite,	170 pounds per cubic foot.
Marble or limestone,	160 pounds per cubic foot.
Sandstone,	140 pounds per cubic foot.
Ordinary lath and plaster,	6 pounds per square foot of surface.

To calculate the dead load of a proposed building it is necessary first to fix upon the general arrangement, disposition and approximate dimensions of all the parts and to estimate approximately their weights. After the calculations are made and the construction detailed, the actual dead loads should be checked to make sure that they agree closely with the assumed load. If considerable variation is found, it can be taken care of by increasing or diminishing the size already determined proportionally, as may seem necessary.

The weights of the various systems of fireproof floors may vary from 60 pounds to 125 pounds per square foot of floor, including the necessary steel and other items used in their construction, and the weight should be justified before finished calculations are made. Generally an assumed load of 80 pounds per square foot of floor will be sufficient for the dead load. In buildings with movable partitions an allowance should be made for their weight in the dead load, if a small dead load is taken.

Live Loads

The live or accidental load for floors is a quantity for which there is no standard, as it consists of the weight of people, machinery, furniture, etc. The requirements of the building laws of Philadelphia, which are a very conservative standard to adopt, are as follows:

"Dwellings, tenant houses, apartment houses, hotels, hospitals and asylums, use a live load of 70 pounds per square foot.

"For office buildings use 100 pounds per square foot.

"For places of public assembly, light manufacturing buildings and retail stores, use 120 pounds per square foot.

"For storehouses, warehouses and heavy manufacturing buildings, use 150 pounds per square foot and upwards in proportion to the loads they may have to carry."

The following data is fairly conservative and may be properly used where there are no building laws to the contrary:

The load of 70 pounds per square foot for dwellings will probably never be realized, but inasmuch as a city dwelling house is liable to be taken and used for some other purpose at any time, it is not advisable to use a lighter load. In the case of a country or seashore house or hotel, or a building of like character, where economy demands it, and where the actual use of the building for a long time is certain, a live load of 40 pounds per square foot of floor is ample for practical purposes, for rooms not used for public assembly. For rooms of public assembly a live load of 80 pounds per square foot is sufficient. If the desks or chairs in a room of this character are fixed, as in a school room, church, etc., a load of more than 40 to 50 pounds per square foot of floor will never be realized, but it is not general practice to consider this, although there are sometimes special cases where economy demands it. Office building floors have been designed for live loads ranging from 20 pounds to 150 pounds per square foot of floor. Retail stores should have floors proportioned for live loads of 100 pounds per square foot and upwards. The floors of wholesale stores, warehouses, machine shops and the like should be designed for live loads of 150 pounds per square foot and upwards. The static loads in textile factories will seldom exceed 40 pounds per square foot. In most cases a live load of 100 pounds per square foot, including the effect of moving machinery should be ample. In general, a conservative rule would be not to assume loads less than the above, but in all cases to be sure that in the actual use of the building, so far as can be foreseen, the loads do not exceed the above.

Furthermore, be sure that the loads used, together with the sections used, do not give excessive deflection or vibration. In a building, stiffness or freedom from vibration is a factor almost as important as mere strength. It is also well to bear in mind that the deflection due to the dead load is permanent and that the only variable deflection is that due to the live load, and that this deflection is the cause of plaster cracks and the like.

The practice in the case of plastered work where a considerable deflection is harmful, is to proportion the beams or girders so that their total deflection will not exceed 1-30 of an inch per foot of span. If the span is not more than 20 times the depth of the beam, the deflection will be within the above limit.

Wind Loads

The wind load on a roof depends upon the pitch or slope of the roof and is usually assumed to be 40 pounds per square foot, horizontal wind pressure; that is, the wind is considered as blowing at this pressure in a horizontal direction; but the resulting pressure upon the roof is always taken normal (at right angles) to the slope.

The wind pressure against a vertical plane depends on the velocity of the wind, and is as follows:

WIND PRESSURE.

Velocity (Miles per hour)	Pressure (Lbs. per sq. ft.)	
10	0.4	Fresh breeze.
20	1.6	Stiff breeze.
30	3.6	Strong wind.
40	6.4	High wind.
50	10.0	Storm.
60	14.4	Violent storm.
80	25.6	Hurricane.
100	40.0	Violent hurricane.

The wind pressure upon a cylindrical surface is one-half that upon a flat surface of the same height and width.

On the assumption of 40 pounds per square foot horizontal wind pressure, use the following for the various slopes, pressure at right angles or normal to the slope of the roof:

WIND PRESSURE FOR VARIOUS SLOPES

Rise 4 inches per foot, use 17 pounds per square foot.
Rise 6 inches per foot, use 24 pounds per square foot
Rise 8 inches per foot, use 29 pounds per square foot.
Rise 10 inches per foot, use 33 pounds per square foot.
Rise 12 inches per foot, use 36 pounds per square foot.
(45 degree angle.)
Rise over 12 inches per foot, use 40 pounds per square foot.

In regard to the wind pressure against the sides of a building, use not less than 52 pounds per square foot for the tenth storey, 2½ pounds ver square foot less on each preceding lower storey, and 2½ pounds per square foot more for each succeeding upper storey to a maximum of 35 pounds at the 14th storey and above.

Snow Loads

The snow load on a roof is generally taken at about 12 pounds per square foot of roof (horizontal area covered) when the slope of the roof is under 12 inches rise per foot of horizontal run, but when the slope is over 12 inches rise per foot, a load of 8 pounds per square foot is considered ample. By "horizontal area covered" we mean the span of the truss multiplied by the distance apart of the trusses.

Tension and Compression

When the forces which act upon a body are exerted in directions away from each other, tending to elongate or stretch the body, this character of the stress is called tensile stress or tension. It is also evident that the forces in the body which resist tension must act inward or towards each other.

When the direction of the forces which act upon a body act toward each other, their combined action tends to shorten or compress the body; this character of stress is called a compressive stress, or compression. It is evident that the forces of the body which resist compression must act outwards or away from each other.

The ultimate strength of any material is that unit stress which is just sufficient to break it.

ULTIMATE TENSILE STRENGTH OF MATERIALS

White pine,	6,000 pounds per square inch of cross section
Hemlock,	4,000 pounds per square inch of cross section.
Spruce,	6,000 pounds per square inch of cross section.
Yellow pine,	8,000 pounds per square inch of cross section.
Oak,	10,000 pounds per square inch of cross section.
Wrought iron,	52,000 pounds per square inch of cross section. (Rods or bars of unusual size.)
Rolled structural steel,	64,000 pounds per square inch of cross section.
Cast iron,	18,000 pounds per square inch of cross section.

For timber, steel and wrought iron, use a factor of safety of four, and for cast iron a factor of safety of six. Thus, to get the safe working value for a certain material, we divide the ultimate value by the factor of safety. The following cement values are the least that should be allowed for a first class cement of Portland grade: Neat Portland cement, one day in air, six days in water, 450 pounds per square inch of cross section. Portland cement and sand in a portion of 1 to 3, one day in air, six days in water, 160 pounds per square inch of cross section. Between the first class Portland cement and ordinary lime mortar, there are a number of grades. Their adaptability will depend upon the special requirements of each case.

Paving and Sewer Work at St. Catharines, Ont.

The amount of money spent in St. Catharines last year on permanent pavements was nearly $62,000. The material used was bitulithic, asphalt block and vitrified brick.

Since permanent pavements were first adopted in this city, in 1906, the following statement shows the class and mileage laid since that year:

PAVEMENTS

Year	Brick Miles	Asphalt Block Miles	Bitulithic Miles	Total Miles
1906	0.560	0.879	0.268	1.707
1908		0.779		0.779
1909	0.389	0.719	0.181	1.287
Total	0.947	2.377	0.449	3.773

The total length of concrete curbing laid this year was 2.228 miles; of sewers, 1.56 miles, and of sidewalks and crossings, 1.250 miles.

The Winnipeg Board of Control, which has been experimenting with air ventilators and Welsbach lamps as a means of deodorizing sewer air, has decided to install the ventilators, as cheaper and more efficient. About 100 will be required for the city, compared to 800 lamps, and the cost will be about $20,000, compared with $200,000 for the lamps.

According to an official report issued by the Canada Cement Company, shipments of cement from the company's cement plants for the [illegible] ending Nov. [illegible] amounted to [illegible] barrels. The total shipments for last year [illegible] barrels. These shipments do not include cement in [illegible]

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[Note.—Contributions suitable for publication in this Department are invited from subscribers and readers.]

High Pressure Connections for Steam Heating

By J. F. Bennett

Generally speaking, heating work nowadays is usually in the form of one or two-pipe, low pressure gravity return systems, or what is known as the vacuum-vapor systems. Occasionally, however, high pressure work, or steam circulation under high pressure, is required.

Just what really constitutes high pressure is a question about which many fitters disagree. The ordinary low pressure gauge registers only 30 pounds, consequently it is customary to call a pressure in excess of 30 pounds, above the atmosphere, high pressure.

Low pressure gravity return systems are usually designed with a sufficient quantity of radiation to heat a building at from one to five pounds' pressure.

The temperature of steam increases, according to the increase in pressure, approximately as follows:

Pounds	Temperature.
1	212 degrees
5	228 degrees
10	240 degrees
25	267 degrees
50	295 degrees
75	320 degrees
100	337 degrees

Obviously, a 100 square foot radiator at 100 pounds pressure, will emit more heat than will a radiator of the same size at one pound pressure. Thus, where the question of space for radiation enters into consideration, a building may be heated by less radiating surface under high pressure than under low pressure.

Again, the radiator connections and general piping for high pressure may be of much smaller sizes than the piping for low pressure. The best practice on high pressure work is the two-pipe system, feed and return. It should also be borne in mind that ordinary cast iron radiators are not built or designed for high pressure, and in ordering radiators it will be advisable to mention the pressure they are intended to carry. The best radiators for high pressure are the tubular pipe radiators, or radiators made of vertical rows of wrought iron pipes, rising from a cast iron base, each two pipes being connected at the top by return bends. Circulation coils, or box coils, are also well adapted for high pressure work, as they will withstand a higher pressure than cast iron radiators will stand.

Most of a steam fitter's work on high pressure heating is in factories, such as mills, woodworking establishments, textile manufactories, and other places where drying rooms are used. Most driers are designed with the intention of getting the greatest possible heat out of the heating coils in the shortest space of time. Sometimes with this object in view, the fan, or blower system, is used under high pressure. Should a pump be used for returning the condensation to the boilers, the returns are connected to a receiving tank from which the cosdensation is pumped into the boiler.

Sometimes a return trap is used to deliver the condensation to the boiler. The returns in this case are carried to a receiver which is connected to a return trap, set from two to three feet above the water line of the boiler.

When the returns come back below the boiler level, two traps are sometimes used; one on the floor and another above the boiler. The lower trap delivers the condensation from the receiver to the upper trap, which, in turn, delivers it to the boiler. The return trap is a satisfactory method of delivering condensation to a boiler, as the trap will deliver the condensation to the boiler at a much higher temperature than a pump will deliver it.

All up-to-date plants provide for automatic water regulation, and there are many and various devices on the market for this purpose. The Vigilant feed water regulator will do for an illustration. This regulator is set so that the bottom of the regulator chamber is from eight to ten inches above the second or middle gauge cock in the water column. A 1¼-inch pipe is connected from the bottom of the chamber to a point below the water line of the boiler. This has a special valve, by means of which the regulator may, if desired, be cut off from the boiler. This valve has an opening on the bottom, from which a drain pipe, with a valve attached, should be run to drain the chamber. The drip from the exhaust valve may be connected to the drain pipe below the drain valve.

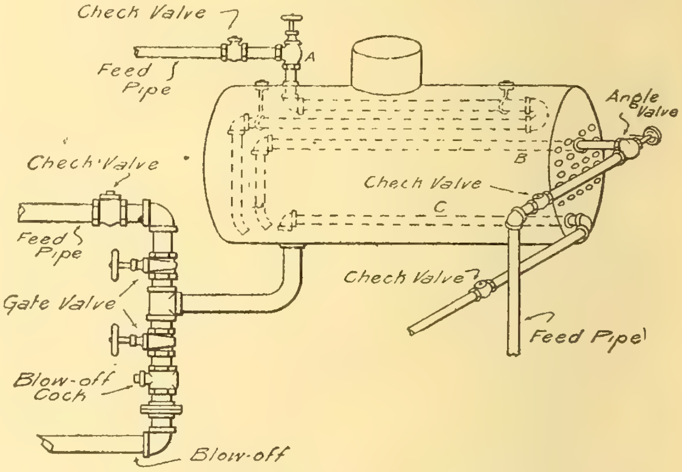


Fig. 1—Four Methods of Connecting Boiler Feed Pipes to Horizontal Tubular Boiler.

The second, or middle, gauge cock is taken off the water column, and in its place is screwed a special angle valve A, fig. 2, which is connected to air valve on top of the regulator chamber. A ¼-inch steam connection is run from some convenient point to steam connection at B. A ¼-inch pipe is connected from the pressure and exhaust valve at C on the regulator, to the top of the controller valve on the feed line. This controller should, if practicable, be placed below the regulator, to ensure a supply of water over the rubber diaphragm. Should it not be feasible to place the controlling valve in this manner, the ¼-inch pipe should be trapped with a U trap bent in the pipe. From the exhaust valve at D a vent, or drain pipe, is connected into the drain pipe below the drain valve, as shown at D.

When the water reaches the opening of the special angle valve (A) in the water column, shutting off the steam, the chamber will fill with water from the boiler, thus reducing the weight of the displacement body by the amount of displacement. The weighted lever will now fall, allowing the pressure valve to open, permitting the pressure to act on the diaphragm of the controlling valve, closing it, and stopping the feed.

When the water falls and exposes the mouth of the special angle valve to the steam, the water in the regulator chamber will be thrown into balance, and the displacement body will resume its lowest position. The rocker arm will be brought into contact with the stem of the valve, opening the exhaust and closing the pressure, relieving the diaphragm and permitting the controlling valve to open and start the feed. The chamber of regulator has to be vented through valve on top of chamber once in 24 hours, in case of accumulated air in the chamber of the regulator.

On the steam line to the pump a diaphragm regulating valve, or pump governor, is placed with a ¼-inch connection from the diaphragm to the feed pipe, fig. 3. The counter-weight on this governing valve is adjusted to maintain a pressure of from 10 to 15 pounds more in the feed line than in the live steam line to the pump. This is as nearly perfect automatic feed pump control as the writer ever saw, and the writer (who has no interest in the regulator or knowledge of the people who control it) has had opportunities of seeing it operating under different conditions in several plants.

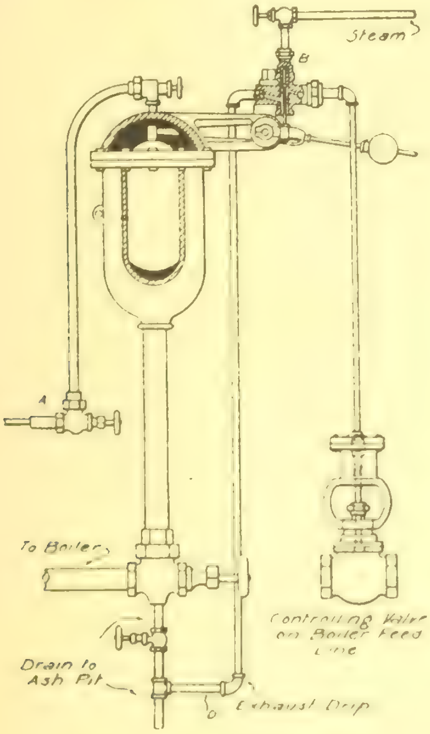


Fig. 2—Sectional View of Vigilant Feed Water Regulator.

There are various methods of connecting feed pipes to high pressure boilers, depending, of course, on the style or the type of boiler. In the Stirling water tube boiler, the feed enters through the top of the rear drum, at the top of the boiler, below the water line. In the Babcock and Wilcox water tube boilers, the feed generally enters the front of the steam drums above the tubes and at a point below the water line of the boilers.

On tubular boilers the feed is sometimes delivered through the blow-off pipe, though this method is questionable, as the feed water, instead of tending to keep the blow-off pipe clean, often causes it to become coated with sediment far worse than if the pipe was used for blow-off purposes only. This is possibly due to the fact that the blow-off pipe from a tubular boiler is generally exposed to intense heat in the combustion chamber, after the heat of the fire, or hot gases, pass the bridge wall before entering into the tubes, or flues. The horizontal tubular boiler is meant in this connection.

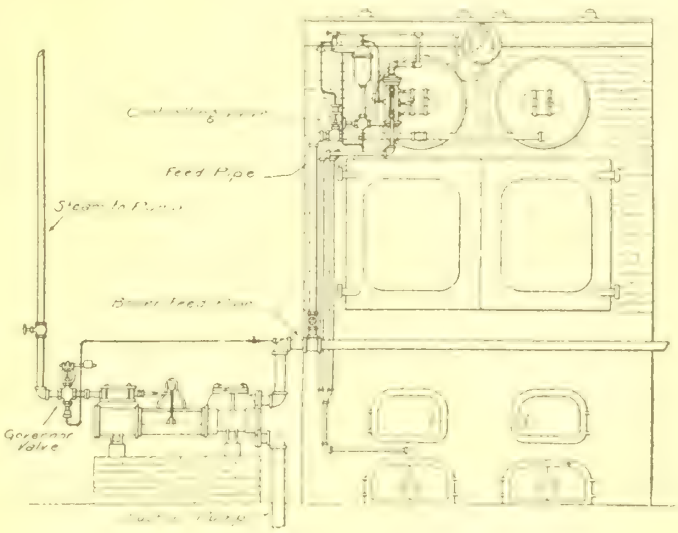


Fig. 3—Vigilant Feed Water Regulator and Fulton Pump Governor applied to Horizontal Water Tube Boiler.

Another method is to run the feed pipe through the top of the shell of the boiler at a point near the back, and to carry it nearly to the front end, from which point it returns to the back end, dropping to below the water line, over the blow-off opening, as in (A) fig. 1.

Again, the feed pipe may be carried through the front head as in B, dropping below water line at the back or the rear end, of the boiler. Or it may be taken through the front head, at a point six or eight inches above the bottom of the shell, and carried directly to the back, discharging as near to the blow-off opening as possible. In all cases the pipe inside of the boiler shell is supposed to heat the feed water before it enters the water being used in the boiler.

Annual Meeting of Winnipeg Builders' Exchange

At the annual meeting of the Winnipeg Builders' Exchange, held recently, Mr. W. H. Carter, of the Carter, Halls, Aldinger Company, was re-elected president. When Mr. Carter was elected to office a year ago the membership of the exchange consisted of only 100. In one year this has been increased to over 300. Other officers elected were: F. H. Davidson, 1st vice-president; Thos. Kelly, of Thos. Kelly & Sons, 2nd vice-president; T. D. Robinson, treasurer; J. H. Buxton (re-appointed), secretary. Messrs. W. P. Alsip, J. W. Morley, H. C. McMartin and Chas. S. Shipman were re-elected to the directorate for a further period of three years. Considerable enthusiasm was manifested on the part of the members in the decision to secure a central site and erect a fine new structure to be known as the Builders' Exchange Building.

LEGAL DEPARTMENT

Information to this Department is requested from Architects, Engineers, Contractors and Builders. Send in the particulars of recent cases in which you were interested stating the main facts tersely.

Payment for Engineering Services—Moore v. March, Divisional Court of Ontario. Held, that accounts of engineers and surveyors employed by municipalities under the Municipal Drainage Act may be audited by the County Court Judge, and no appeal will lie to the Divisional Court from his certificate, as it is not an affirmative order that can be enforced, there being no direction for payment of what the judge found to be due the engineer or surveyor by the municipality. This action was an appeal by J. H. Moore from a certificate of Judge McTavish, of the Carleton County Court, disallowing $896 of charges made for engineering services to the township of March. The total amount of the account was $3,189.74. The $896 deducted was disallowed by the County Court judge on the main ground that the engineer had charged for the services of certain persons, to whom he had delegated parts of the work, a larger sum than he had actually paid these persons. In stating the finding of the court, Mr. Justice Riddell said: " . . . the County Judge disallowed a very large part of the account, proceeding, as I think, upon a wrong principle. I may say that, had I been auditing this account, the amount disallowed would have been of a trifling character. The judge is no doubt given jurisdiction. The method in which this jurisdiction is to be exercised is prescribed: (1) the bill is to be filed with the clerk with all requisite details; (2) the clerk is to deliver the account to the County Judge; (3) the County Judge is to appoint a time and place at which he will proceed with the audit; (4) the clerk is to give at least two days' notice of the audit to the engineer and the head of the municipality; (5) at the time and place fixed the County Judge shall audit the account, being given the power to disallow any charges which he may deem unreasonable (not which are unreasonable in fact or in the opinion of some other judge or tribunal), and (6) he shall certify to the amount to which in his opinion (not the opinion of someone else) the engineer is entitled. Much as I regret the result, it is in my view inevitable. The Legislature has in effect determined that an engineer employed under the Act is not to be paid what his services are worth, but what the County Judge thinks they are worth. The appeal must be quashed."

A Bag of Cement is One Cubic Foot of Cement

The commercial unit of measure of cement is the barrel. The output of a cement mill is counted in barrels; the listed price of cement is the price per barrel. The paradox is that almost no cement is shipped in barrels: few cement mills could fill an order for cement in barrels without inconvenience, says "Engineering-Contracting." The unit of shipment is the bag. Its only relation to the commercial unit of measure is that a bag of cement is one-fourth of a barrel. This means that a bag of cement is 95 pounds net of cement, that is one-fourth of 380 pounds, which is the net weight of cement in a barrel. This weight, 380 pounds, is the only definite thing about a barrel of cement. Its volume is variable, somewhere between 3 and 3½ cubic feet. This is volume of packed cement. A packed bag of cement contains then from 0.75 to 0.875 cubic feet. Pour a bag of cement into a box loosely and its volume is 20 to 30 per cent. more than it was packed in a bag. Mix this loose cement with water into a paste and its volume is decreased about 15 per cent., but it is yet more than when packed in the bag.

The points we wish to bring out are that a bag or a barrel of cement are both variable in volume and that barrels are no longer used to any extent to ship cement. The contractor receives his cement in bags: if he wishes or finds it necessary to measure or proportion in terms of barrels he calls four bags a barrel, and proceeds accordingly. What reason is there for continuing further to use the barrel as the unit of measure of cement in proportioning concrete? The barrel of cement no longer exists as an actual unit of measurement; it is merely the fictional unit of the book writer and statistician.

This leads to the question, why not, therefore, consider the bag as the unit of measurement in proportioning concrete? Contractors invariably make it the unit. A concrete proportion is to them invariably one or more bags of cement to so many cubic feet of sand plus so many cubic feet of stone. A 1:2:4 concrete means to the contractor 1 bag of cement, 2 cubic feet of sand and 4 cubic feet of stone, and this is exactly how he proportions the mixture unless the specifications prohibit him from so doing. This brings us to another question: Why not consider a bag of cement of full weight as 1 cubic foot of cement? Some engineers are doing so and have gained much in facilitating work without any significant loss, so far as we can see, in any respect. The following specification has been used for the last five years by a prominent Chicago engineer.

"The unit of measurement for cement shall be the bag received from the manufacturer having a gross weight of not less than 95 pounds. Such a packed bag shall be considered as equal to one cubic foot of cement. The contractor shall mix his concrete in batches calling for even bags when possible. If compelled to use fractions of bags, said fractions shall be weighed upon the assumption that the neat cement weighs not less than 94 pounds per cubic foot. If bags received from the manufacturer contain less than 94 pounds net of cement the contractor shall bring up the weight with additional cement. If the bags weigh uniformly more than is here called for the contractor shall be allowed to remove the excess cement provided each bag thus altered is altered by weight. The inspector shall weigh one bag in forty as the cement is received, in order to check weights."

Is there any good reason why such a specification should not become general? We believe it would meet with favor from contractors. What serious objections can engineers offer to it?

A company with a capital of $500,000 has been incorporated for the purpose of finding and developing slate quarries in New Ontario. It is said there are fine deposits in the new north lands.

At least one city engineer in the Dominion played the part of Santa Claus this Christmas. At London Ont., every year a number of pathetic little notes from poor children are addressed to this deity (Santa Claus) through the mail. City Engineer Graydon conceived the idea of having these letters sent to him and of gladdening the hearts of the youngsters by fulfilling the requests contained therein. Everyone will commend such generosity, but it is to be feared that next year will witness a phenomenal run on Santa Claus in the Forest City.

Personal News and Notes

Mr. McCullough, city electrical engineer of Vancouver, B.C., has resigned.

A visitor to Ottawa at Christmas was Mr. Ed. Petrie, of the harbor engineering staff of the G. T. P., Prince Rupert, B.C.

Mr. C. H. Topp, city engineer of Victoria, B.C., has resigned. Assistant City Engineer Bryson is filling the position temporarily.

City Engineer Laternell, of Edmonton, Alta., in company with Mayor Lee, will visit eastern and southern cities to secure new ideas on civic administration.

Mr. Chas. Murray, formerly a contracting plasterer of Winnipeg, Man., where he resided for the past 30 years, died suddenly last week at the age of 60 years.

Mr. E. J. Cagney, formerly contracting agent for the Montreal Light, Heat & Power Company, now in charge of the Central Georgia Power Company, spent Christmas in Montreal.

Arthur Freeman, consulting engineer, has opened an office at 514 Continental Life Building, Toronto. Mr. Freeman's specialties are heating, ventilating, sanitary plumbing, and kindred lines.

The entrance examinations of the Province of Quebec Association of Architects will be conducted at 5 Beaver Hall Square, Montreal, and at the City Hall, Quebec Que., on Jan. 24th and following days.

The death occurred last week of Mr. William Baker, a well known building contractor of Warwick, Que. The late Mr. Baker was born in Birkswell, England, in 1836. He emigrated to Canada and settled in Arnprior in 1857, carrying on a successful business for many years.

An employee of the Hamilton Bridge Works, named Wm. J. Kearney, met with a fatal accident last week He was caught between an electric carrier and a heavy girder, and died the following day from his injuries. He was 51 years of age.

At the regular meeting of the Toronto branch of the Canadian Society of Civil Engineers, on the 30th ult., Mr. C. N. Monsarrat, engineer of bridges for the C.P.R., gave an illustrated address upon the construction of the Lethbridge viaduct. Mr. Monsarrat's interesting account of this important work appeared in the "Contract Record" in the issues of December 22 and 29.

Mr. Robert Patterson, one of the earliest western pioneers, formerly well known as a railway contractor, died at Knowlton, Que., on Christmas Eve. The late Mr. Patterson had been associated in the course of his enterprises with Mr. J. J. Hill and Lord Strathcona. He was 82 years of age and was [illegible] well known and respected by old timers of the West. Mr. Patterson was a native of St. Andrews, Fifeshire, Scotland.

Mr. John Wagner, junior member of the firm of John Wagner & Son, Cleveland, Ohio, contractors for the high level intercepting sewer at Toronto, met with a serious accident last week. Mr. Wagner, who was superintending the work, fell down a shaft of the sewer at the corner of Adelaide and John streets, a distance of about 30 feet, sustaining a fractured collar bone, fractured shoulder blade and three broken ribs, one of which penetrated his lung. Mr. Wagner is 39 years of age. From enquiries at the General Hospital we learn that while the condition of the injured man is very grave, he is resting quietly and doing as well as can be expected at this stage.

Recent Publications

"Structural Details, or Elements of Design in Heavy Framing." By Henry S. Jacoby, professor of bridge engineering in Cornell University. Profusely illustrated with figures in the text, six folded plates and 34 full page illustrations. Cloth, $2.25 net. New York: Jno Wiley & Sons. Presents complete information on design of joints, beams and trusses in a lucid and systematic manner; also practical data on timber construction

"Masonry Construction." By I. I. Baker, professor of civil engineering, University of Illinois. Contains 746 pages, over 100 tables and 244 illustrations. Cloth, $5 net. New York: John Wiley & Sons. Tenth edition. Additional information will be found on plain concrete and in the three new chapters on reinforced concrete. concrete building blocks, etc. Latest and approved engineering practices. Should prove of material assistance to the progressive contractor.

Calendars for 1910

The Hamilton Bridge Works Company, Limited, have favored us with an exceptionally fine calendar for 1910. The illustration is entitled, "Where the Fox Ran," and is a colortype reproduction from an original painting by W. Verplanck Birney, A.N.A., exhibited in the National Academy, New York, 1908. It were hard for the Hamilton Bridge Works Company to have chosen a more interesting subject. The red coat of the huntsman, the world over, has a peculiar fascination for the Britisher. Those who were fortunate enough to receive a copy of this calendar will have a constant reminder of a fine old sport that is linked with some of our most honored traditions. And what is perhaps more significant, they will have a creditable souvenir of one of the most enterprising bridge building concerns in Canada.

The Kerr Engine Company, Limited, Walkerville Ont., sent out a particularly attractive calendar entitled "The Shepherdess and Her Flock," a delightful picture reproduced from a painting by Wilm Steelink. The object of the calendar as defined by the company is to serve as a daily reminder of the company's increased desire and ability to render satisfactory service in every detail of their business.

The B. Greening Wire Company, Limited, Hamilton. Ont., have favored us with a copy of their 1910 calendar, which is well adapted to office requirements. A view of the extensive works of this concern is shown above the date sheets, also photos of the president and former founders.

Another good plain office calendar was that sent out by F. H. Hopkins & Company, dealers in railway and contractors' supplies, Montreal, Que. The leading lines of the company are illustrated on the various sheets of this calendar.

The customers and friends of Mussens Limited, of Montreal, dealers in machinery and supplies of all kinds, were favored with a large office calendar containing illustrations and lists of a few of their various lines.

The latest line on the calendar distributed by the Universal Portland Cement Company, Chicago and Pittsburg, reads as follows: "It's so good that 28,000 [illegible] are [illegible]."

A paper entitled "Artistic Park Bridges," will be read before the Canadian Institute, 198 College street, Toronto, on Saturday, Jan. 8, by Mr. C. H. Young, B.A.Sc., of the firm of [illegible] & Young, consulting engineers.

Ambitious Contractors at Hamilton, Ont.

An interesting circumstance in connection with the contest for aldermanic and other civic honors at Hamilton, Ont., this year was the number of candidates connected with building and contracting interests. Of the contractors, we noted Mr. Benjamin Johnson and Geo. H. Milne, both for alderman, and Mr. John Allan and ex-Ald. Findlay for the Board of Control. The plumbing industry was represented by Mr. Andrew Rodgers, manager of the Rodgers, Wray & Greenway Company, and Mr. Hugh S. Wallace. Another aldermanic candidate was Mr. W. Barrett, painting contractor.

Mr. John Allan was born in Guelph, and went to Hamilton when six years of age He spent his boyhood in the city, and later went to New York, where, for many years, he was a successful builder. He is a past vice-president of the International Bricklayers' Union, and was treasurer of the Harlem Union, No. 37, for 15 years. Mr. Allan has since retired from business.

Mr. Andrew Rodgers, manager of the Rodgers, Wray & Greenway Company, plumbers, has been a resident of Hamilton all his life. He has conducted a plumbing business in the city for the past 20 years.

Mr. Hugh S. Wallace, a former plumber and steamfitting contractor, was for 29 years in business in Hamilton. For eight years, from 1900 to 1907 inclusive, he served in the city council, and during that time was for four years chairman of the sewers committee. He was also a member of the finance, harbor and beach, and fire and water committees.

Ex-Ald. Findlay is a native of Scotland, and a well known contractor at Hamilton. He has been in the city since 1868, and has been much in the public eye during that time. He was a member of the city council for about 12 years, and for two years was chairman of the board of works. He opposed John S. Hendrie, in 1901, and T. J. Stewart, in 1907, in mayoralty elections, but was unsuccessful in either case.

Mr. W. Barrett, painting contractor, went to Hamilton from London, Eng., about 36 years ago, and has been in the business he now follows for about 30 years.

Railroad Work Exciting at Prince Rupert

Some interesting problems are encountered occasionally on Grand Trunk Pacific construction out Prince Rupert way. A recent dispatch from this city describes a piece of the work recently carried out by Ross & McColl, who are building the second section of the line out of Prince Rupert. It was found necessary to make an attack upon 40,000 yards of rock which had the appearance of a solid precipice. A charge of 36,000 pounds of virite was used and after the shot was fired nothing remained of the bluff but a fragmentary mass of boulders. The writer of this account states that, "It is an item in the humdrum of the day's proceedings to rush to the hill tops and shiver and gasp, as with a great convulsion the hills are torn asunder with a mighty roar, a flash, and the sky is blackened with what, a second before, was a solid precipice and now a cloud of dust and fragments of rock." This is what might be termed local color.

Vancouver has received an expert report from Chicago that wood blocks are now favored by the best authorities as paving material.

A fire escape recently patented by a New York man consists of a fireproof tower, containing a separate spiral tube leading from each floor to the street, to lessen the confusion should a single tube be used for all floors.

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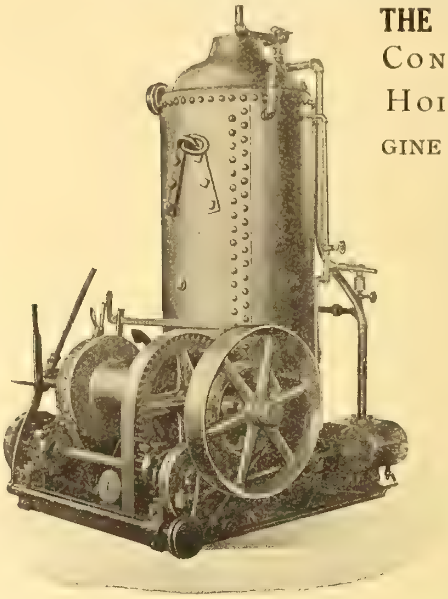

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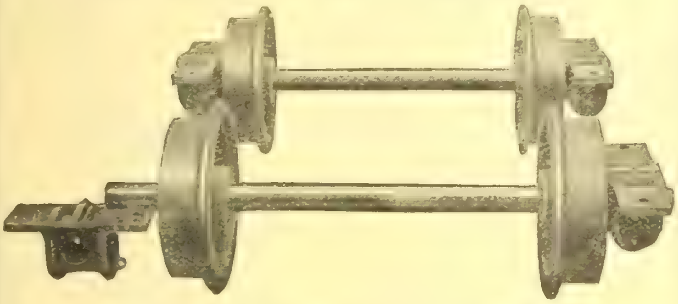

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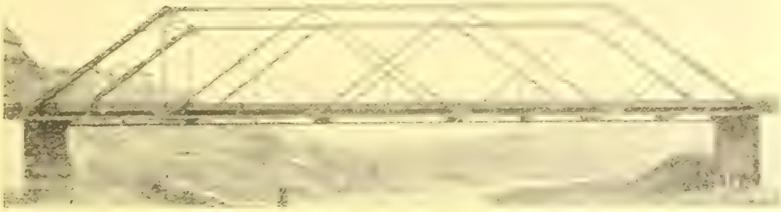

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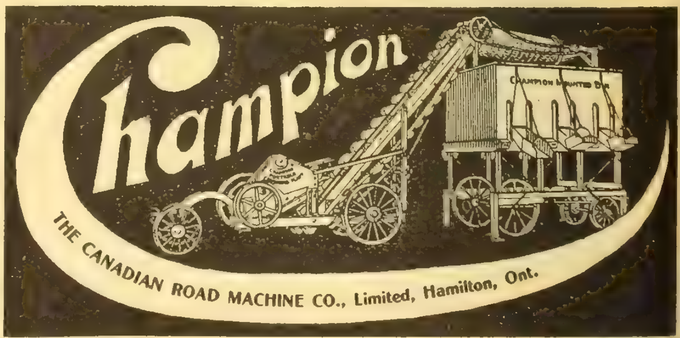

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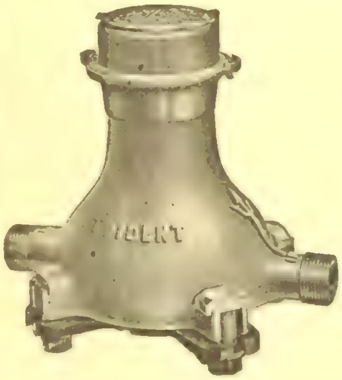

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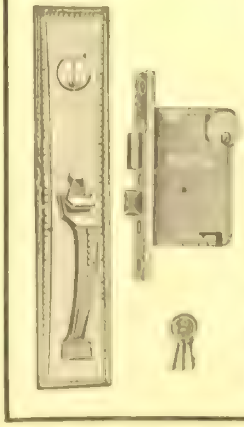

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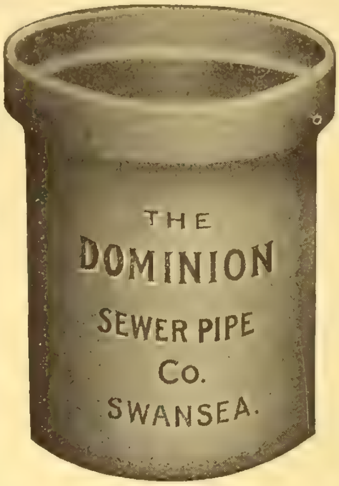

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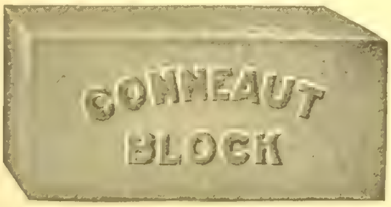

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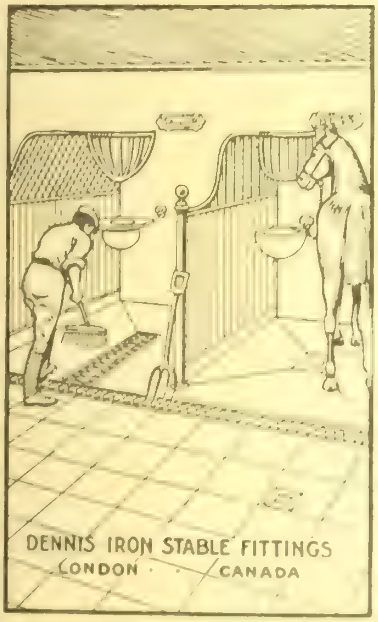

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Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, for foundation work	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b. with 30 and 5 per cent. off for wholesale:—

	Star	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7.25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, any color, ¾-in. square, 1-in. hex. and 3-16-in. round, 35 cents per square foot up.
Floor Tile—½-inch square, 45 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 35 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish, colors, firsts, 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G. cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Brass Goods, Valves, etc.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.
Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.
No. 4 compression bath cock........net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Furnaces, 45 per cent.; registers, 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.; other specials, 40 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00

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Lead pipe, 27½ per cent. off.; lead waste, 27½ per cent. off; caulking lead, 4½ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 70; malleable bushings, 67½; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 67½ per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.

7 and 8-inch pipe, 40 per cent.

Light pipe, 60 per cent.; fittings, 70 per cent.

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Cement, wholesale lots of 1,000 barrels, f.o.b. Toronto, $1.30.

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Burnt River rubble, stone delivered, $13.50 to $15 per toise.

Free stone, delivered, $13.50 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.20 to $1.25 per ton.

Scotch fire brick, delivered, $30 to $35 per thousand.

Steel channels and beams, $2.75 per 100 pounds, delivered.

Lime, per cwt., delivered, 38 cents.

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plasters, $5.50 per ton.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $7.50 to $8.00 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.

Pure Green Seal Zinc White, ground in oil, $12.50 to $13.00 per 100 lbs.

Boiled Linseed Oil, in barrels, 78 cents per gallon of 9 lbs.

Raw Linseed Oil, in barrels, 75 cents per gallon of 9 lbs.

Turpentine, in barrels, 80 cents per gallon of 8 4-10 lbs.

Pure Linseed Oil Putty, 25-lb. tins, $3.25 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $2.75 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

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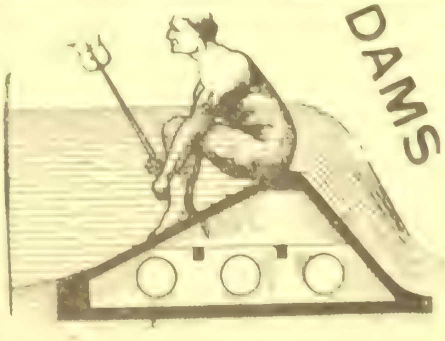

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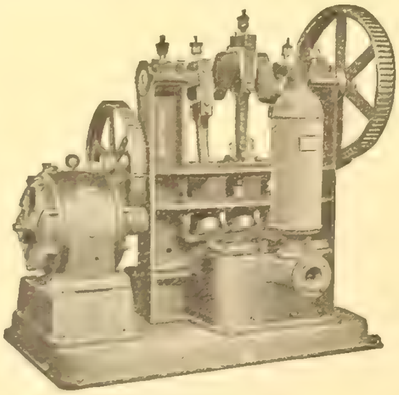

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50	Private Residences	1,023,050	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables,	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and FireHouses	208,664	28,837
656	Total 1st	12,800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
717		17,562,741	

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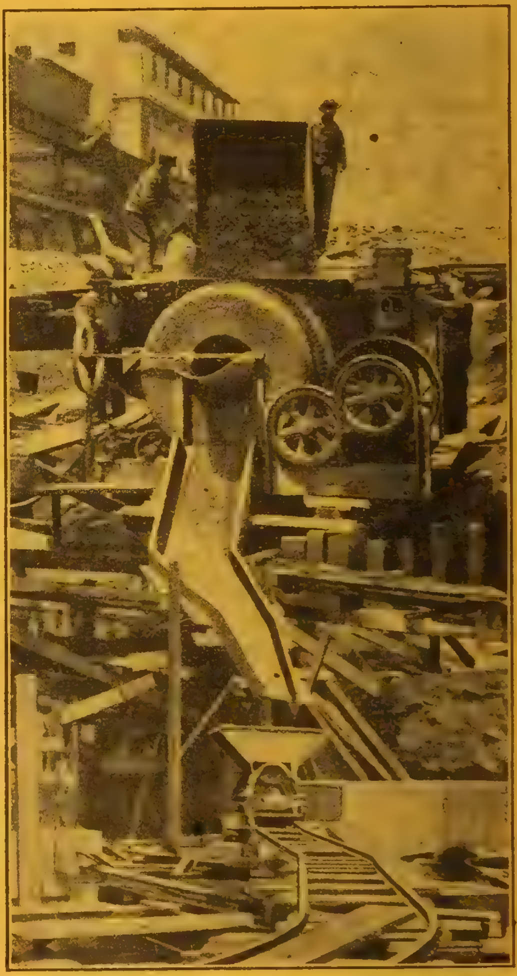

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Vol. 24 Toronto, January 12, 1910 No. 2

ESTABLISHED 1886

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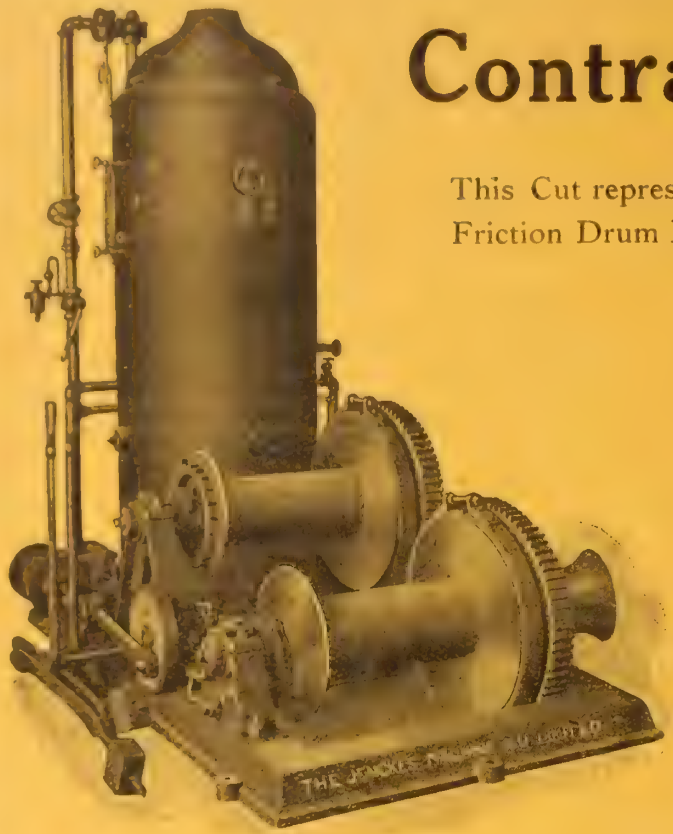

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Drums 10 in. x 24 in. face.

Lower drum shaft extended and carrying winch head.

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Architects desirous of having a reputation of always recommending the best will act directly in their own interests by specifying "LUXFER."

Luxfer Prism Company, Limited
100 King Street West, TORONTO

Scientific Tests of

MISSISQUOI MARBLE

Nothing demonstrates the high quality of this famous marble like the report of Prof. H. M. MacKay of the Civil Engineering Department of McGill University, Montreal, who made tests of samples of our output. The following is his report :

Gentlemen,

Following are the results of tests of the samples of marble submitted by you :

Compression Tests

The compression tests were made upon 2 inch cubes and were carried out in the Wicksteed Testing Machine. :: :: :: ::

"Windsor Gray" Sample No. 1

Area of cross section 3.98 sq. inches.
Maximum load 85,100 lbs. 21,380 lbs. per sq. inch.

Sample No. 2

Area of cross section 4.04 sq. inches.
Mamimum load 86,000 lbs. 21,280 lbs. per sq. inch.

"Eureka." Sample No. 1

Area of cross section 3.86 sq. inches.
Maximum load 84,000 lbs. 21,760 lbs. per sq. inch.

Sample No. 2

Area of cross section 4.04 sq. inches.
Maximum load 92,500 lbs. 22,900 lbs. per sq. inch.

It will be noted that the compressive strength is exceptionally high and compares favorably with the best grades of granite. :: :: ::

Absorption Test

Two roughly broken samples after having been thoroughly dried were immersed in water for 48 hours with the following results:—

	Wt. Before Immersion	After Immersion	Gain	
Sample 1......	1.3770 lbs.	1.3780 lbs.	.0010	0.072
Sample 2......	1.9540 "	1.9555 "	.0015	0.076

Specific Gravity 2.71. Wt. per cubic foot 169.5 lbs. The percentage of moisture absorbed is thus remarkably low, which indicates, in my opinion, a stone which should have exceptionally good weathering qualities.

Yours very truly,
Montreal, July 13, 1909. Sgd. H. M. MacKay.

Canadian Architects, Builders or Contractors need have no hesitation in recommending this celebrated Canadian Product. :: :: :: :: :: :: ::

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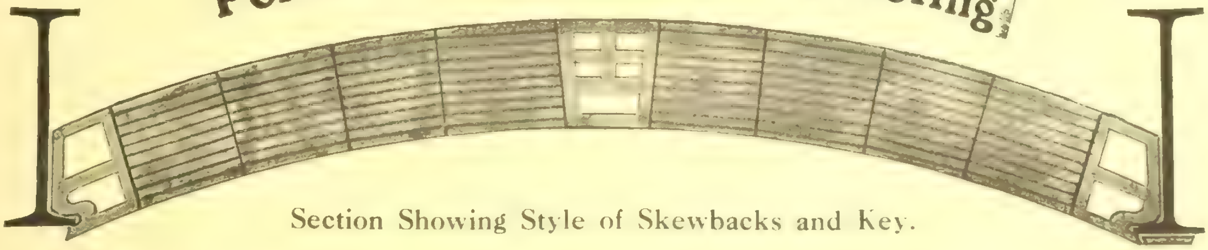

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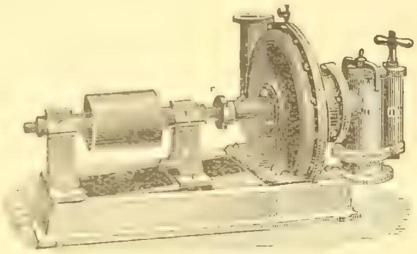

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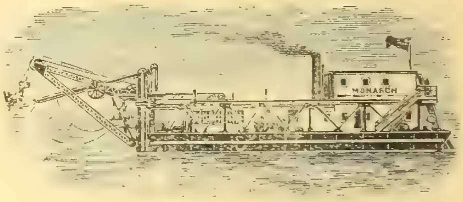

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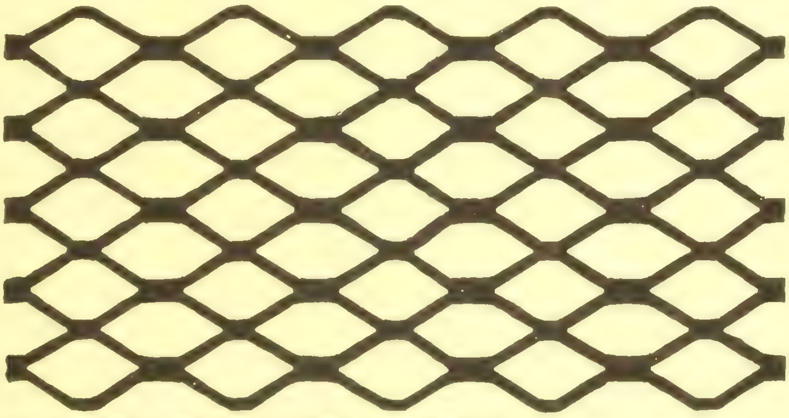

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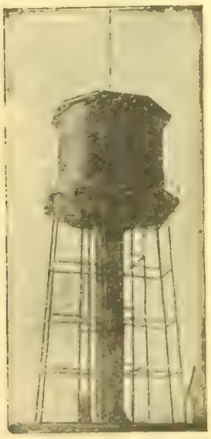

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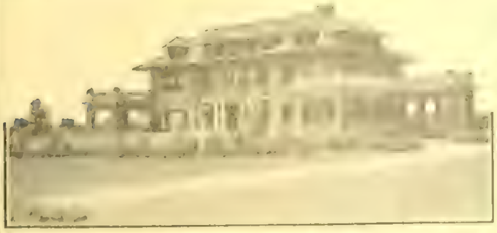

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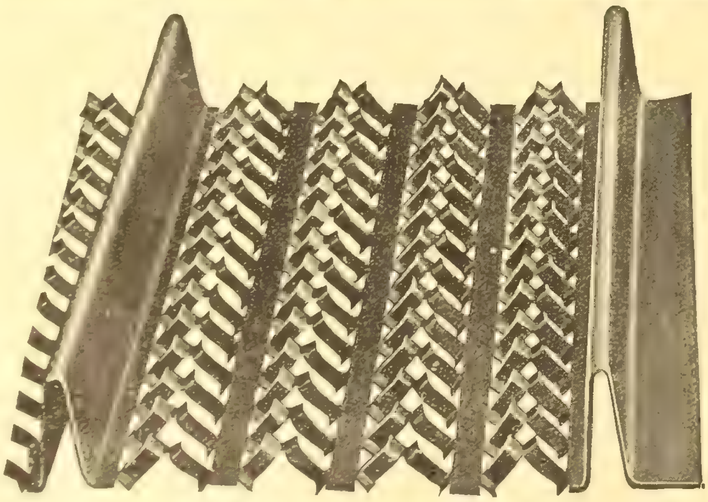

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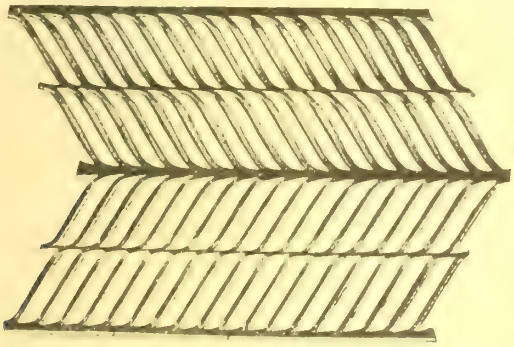

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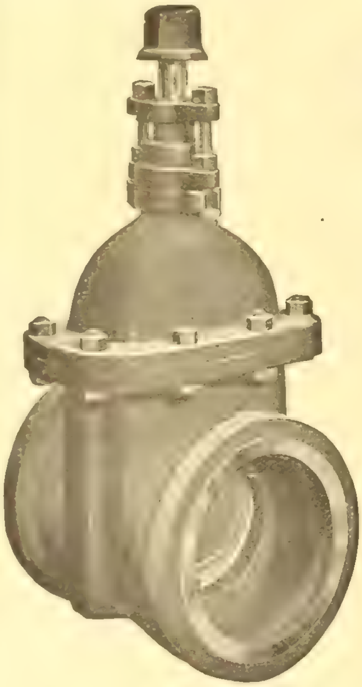

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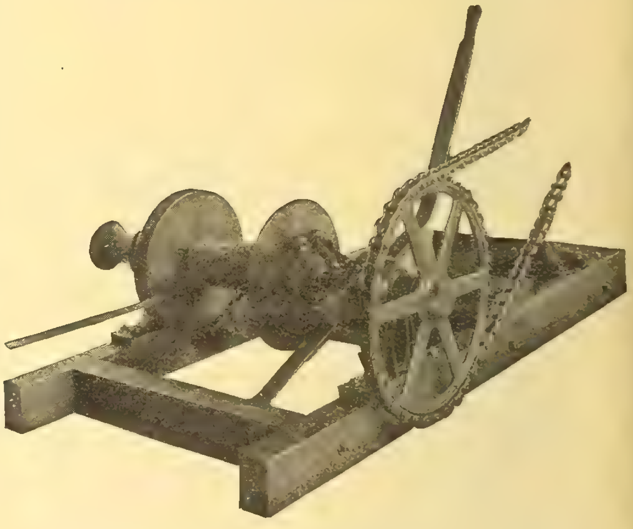
WALKERVILLE, Ontario

"London" Friction Clutch Hoist



We have designed and perfected a hoist that would meet the demand for a simple and durable hoist at a moderable cost. The "London" is a powerful hoist for use with any style of Gas, Gasoline or Oil Engine.

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James Thomson, President. J. G. Allan, Vice-President. James A. Thomson, Secretary. Alex L. Gartshore, Treasurer.

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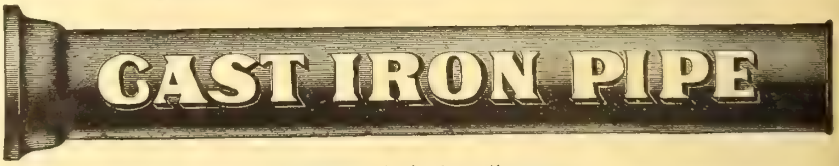

3 inches to 60 inches diameter

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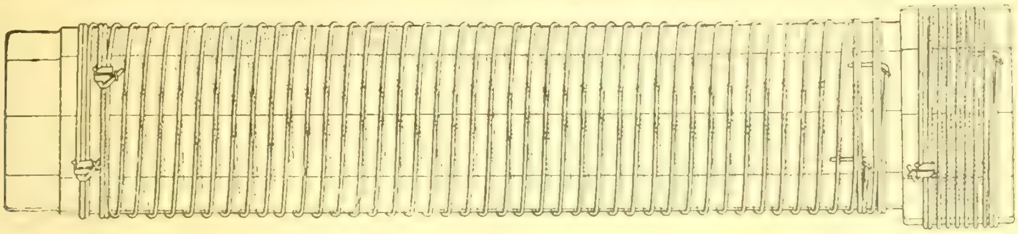

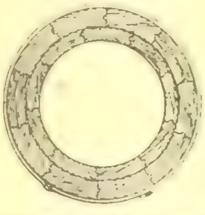

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The Dominion Wire Wound Wood Water Pipe

Showing special method of winding with two independent parallel wires. The great advantage of this is that in event of one wire becoming damaged the pipe still retains a factor of safety of 2.5. Made only by

The Dominion Wood Pipe Company, Limited New Westminster, B.C.

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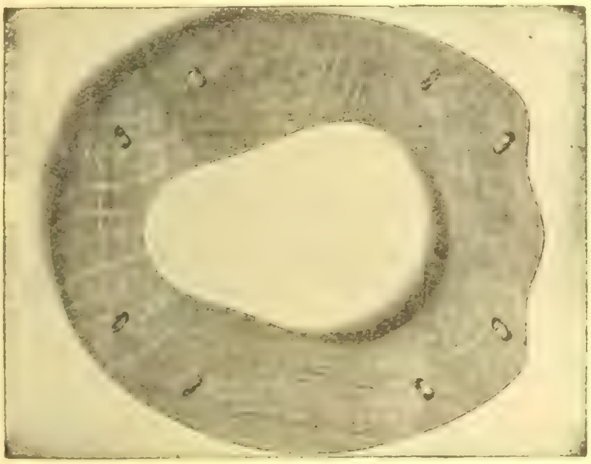

These seats are make in four sections which are tongued and grooved, glued together and held rigid by a heavy bolt at each joint.

Goderich Organ Co., Limited Goderich Ontario

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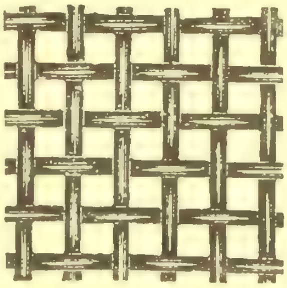

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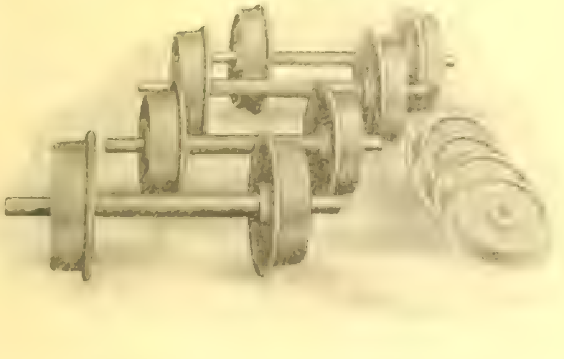

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Unequalled in fineness and quality.
Fully Guaranteed.
Present capacity 500,000 Barrels Annually.

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Superior brand is uniformly the finest ground cement in the Canadian Market—hence the strongest.

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Who are the Sole Manufacturers of "Corinthian Stone"
Office and Works - - **G.T.R. Junction, Guelph, Canada**

GERMAN ALSEN, at higher prices than competitors, has again this year been awarded the most important contracts of the World, because practical tests by leading Engineers proved its merit and relative economy.

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- **Also enormous quantities for the PACIFIC COAST, AUSTRALIA, ENGLAND, SOUTH AFRICA, &c.** -

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CEMENT 45 BROADWAY, NEW YORK CITY CEMENT
We protect our customers!
See page 132 in "Sweet's" for full particulars

The Municipal Construction Co.
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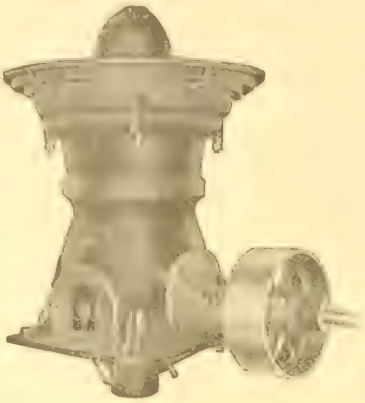

is fast outdistancing all others. Among those who want the best results, coupled with proper economy, there is no question what make to buy.

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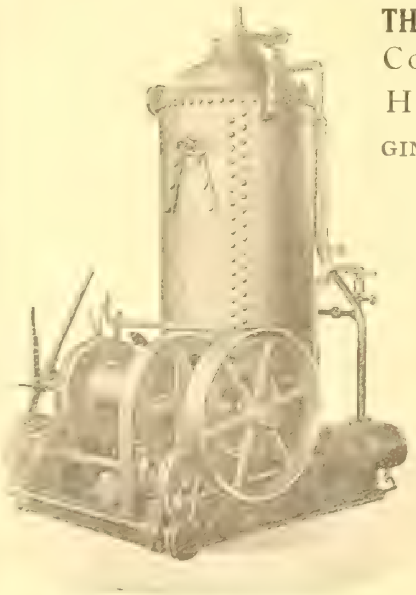
Hoisting Engines

from 4¾ x 6 to 8 x 12 in. IN STOCK FOR IMMEDIATE DELIVERY.



THE "MIDLAND" CONTRACTORS' HOISTING ENGINE will operate your material elevators, do light pile driving, Run a pump or circular saw.

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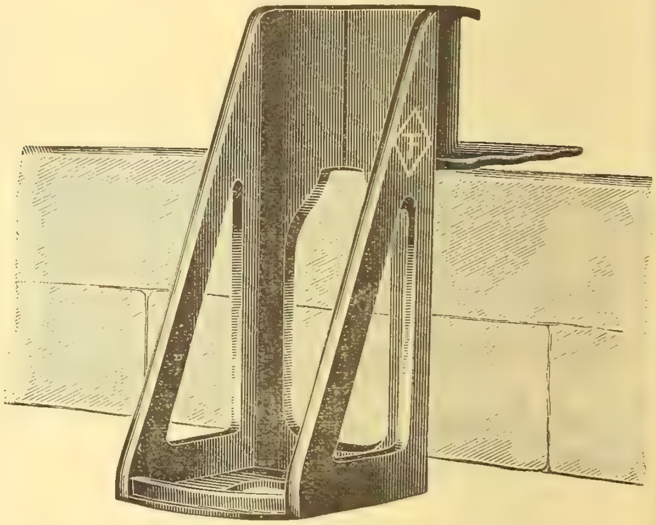

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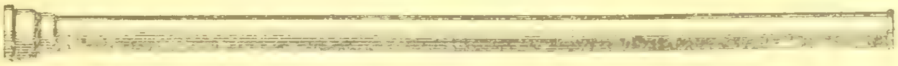

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Tongue and groove. Hollow backed.
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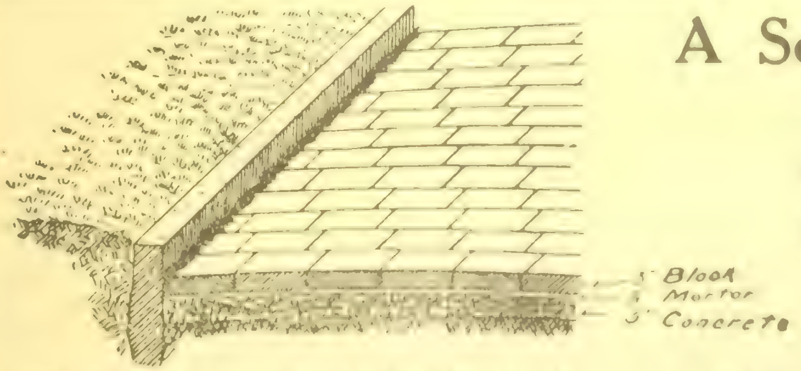

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Dorval, Que.

Tenders will be received until January 18th for the construction of about six thousand feet of cement sidewalk, plans at the office of D. H. Dupont, 62 St. James street, Montreal. Alphonse Decary, 415 New York Life Building, Montreal, secretary-treasurer.

Moncton, N.B.

The city engineer has presented his report regarding the new water supply. Estimated cost of second reservoir is placed at $212,000.

Montreal, Que.

Mr. T. H. Pitcher, general manager and chief engineer of the Montreal Water and Power Company, is authority for the statement that his company will proceed with the construction of a modern filtration plant. It is expected that the work will be so far advanced by next winter that the plant may be placed in operation.

Rainy River, Ont.

A bylaw to raise $7,000 for sewer construction was carried.

Trail, B.C.

Plans for the installation of waterworks here, have been submitted to the provincial government for approval.

Toronto, Ont.

Tenders addressed to G. R. Geary, Chairman, Board of Control, will be received until January 18th for the construction of the following sewers: Dingwall avenue, from Pape avenue to east end; Albany avenue, from C. P. R. to Davenport road; Campbell avenue, from Lytton to Davenport road. Envelopes containing tenders must be plainly marked on the outside as to contents. Specifications, etc., at the office of City Engineer Rust.

Welland, Ont.

The bylaw to raise $125,000 for pavements was defeated.

AWARDED.

Montreal, Que.

The contract for the supply of structural steel for power racks and tail race bridge has been awarded to the Dominion Bridge Co., of Lachine, by the Canadian Light & Power Company.

The Canadian Light & Power Company have, awarded to the John MacDougall Caledonian Iron Works Company, Limited, the contract for the supply of cast iron wheel chamber drain pipe required for their power development at St. Timothee, Que.

Verdun, Que.

In connection with the new municipal power house the following tenders for the installation of pumps were received:—Messrs. Laurie & Lamb, $2,300; Canada Buffalo Forge Company, $1,170; Peacock Bros., 1,920; Drummond McCall, $1,600. On the recommendation of the special committee it was decided to award the contract to Laurie & Lamb on the ground that their pumps were more economical in steam consumption. This company will supply high efficiency centrifugal pumps which will be direct connected to Bellis Morcom engines. The following tenders were received for the supply of a 250 horse power boiler: Polson Iron Works, $4,615; Robb Engineering Company, $4,990; Babcock & Wilcox, $5,500. The design tendered by the Maxim Boiler Company being too large for the space available the contract was awarded to the Polson Iron Works.

Railroads, Bridges and Wharves

Edmonton, Alta.

McLeod Bros., who have the sub-contract for 240 miles of G. T. P. construction east of Prince Rupert, say steel-laying there will begin in the spring. Work is progressing very fast.

Howick, Que.

Tenders addressed to D. R. Hay, secretary-treasurer, this place, will be received until January 25th by the municipal council of the parish of Tres St. Sacrement, in the County of Chateaguay, for furnishing the necessary material and building the concrete abutments for the Allen's Corners bridge. Also, the erection of the iron and steel structure for the same bridge. Plans, etc., at the office of the above mentioned.

Montreal, Que.

The G. T. P. during the current year anticipates building from Wolf Creek to Tete Jaune Cache, a distance of 109 miles—also to complete the line in British Columbia from Copper River to Aldermere (on the west end), a distance of 135 miles.

The Grand Trunk Pacific Dock Company, with a capital stock of $150,000, has been organized on the coast. The officers are: President, Chas. M. Hays; secretary-treasurer, Henry Phillips, Montreal. One of the first undertakings of the new company will be the construction o new docks at Seattle, Victoria, and additional docks at Prince Rupert. Previously mentioned.

North Vancouver, B.C.

G. A. Stimson & Company, Toronto, Ont., have purchaesd $128,000 debtenures bearing five per cent. interest and maturing 1949. The bonds are issued for building a new ferry and wharf, etc.

Port Burwell, Ont.

Marine Inspector Capt. G. C. Coles, of Collingwood, who has been inspecting the harbor here, will recommend to the Department of Marine the construction of a breakwater off the piers to stop the drifting sand. He estimates the expenditure at $20,000.

Regina, Sask.

G. H. Pope, right of way agent for the G. T. P., has finished his work in connection with the line to run south to the international boundary, and he states construction will be commenced early in the spring. This will be a continuation of the line which will run to Le Pas, where it will connect with the proposed government line to Fort Churchill on Hudson's Bay.

AWARDED.

Quebec, Que.

The contract for removing the debris in connection with the collapsed Quebec bridge has been awarded to Capt. Charles Koenig, this city, for $60,000.

Winnipeg, Man.

M. Peterson, Secretary, Board of Control, writes that the contract for supply of labor and materials for additions to piers of Louise bridge, across the Red river, have been awarded to John Gunn & Sons, contractors, this city, at $13,890.

Public Buildings, Churches, Schools, etc.

Dauphin, Man.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, Ont., will be received until January 24th for post office fittings, this place.

Plans, etc., on application to Mr. T. H. Richards, caretaker, public buildings, Dauphin, and at the Department of Public Works, Ottawa.

Estevan, Sask.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, Ont., will be received until January 21st for local post office fittings. Plans, etc., to be seen on application to Mr. G. F. Faulkener, caretaker, public building, this place, and at the Department of Public Works.

McKenzie & Prevost Company, general contractors, this place, state that a new 8-room school is contemplated, work to commence early in the spring. Work on the new hotel, for which they have the contract, is being pushed, with the expectation of having it finished by the first of May.

London, Ont.

The promoters of the new Masonic Temple have been incorporated, with officers as follows. President, P. W. D. Brodrick; vice-president, A. B. Greer; secretary-treasurer, S. Baker. $20,000 worth of stock has so far been subscribed and tenders will be called for as soon as the design has been selected. Noted in issue of December 29.

No. 2 Committee, Board of Education, was instructed to obtain plans and call for tenders for the new school on Colborne street. Dr. Wyckoff, chairman.

Montreal, Que.

The Italian Methodists of Montreal are considering the erection of a church building in Laurier ward.

The Letellier Club contemplate the erection of a club house at an early date.

Dr. Desaulniers, M.L.A., announces that a new military school will be built on the South Shore at a point between St. Lambert and Longueuil. This has now been decided by the Federal Government [illegible] of other [illegible]. Noted in issue of December [illegible]

A [illegible] the advisory [illegible] waited upon [illegible] government [illegible] for financial aid towards the new building for [illegible] which call for [illegible], not including inside furnishings. J. H. Ahsdown, J. Galt and J. A. M. Aikins, K.C., are members.

Nelson, B.C.

The private hospital owned by Miss Debrissay has been purchased by the directors of the general hospital. It is under-[illegible] will be used for a new modern hospital next summer.

Quebec, Que.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, Ont., will be received until January 14th for alterations to examining warehouse, this city. Plans on application to A. R. Decary, District Engineer, Post Office Buildings, Quebec.

Owen Sound, Ont.

Erratum.—The bylaw for the erection of the public library, according to the latest count, has been defeated by the ratepayers, and not passed as reported in last issue.

Ottawa, Ont.

With regard to the new Masonic Temple, mentioned in issue of November 10th, a company has been incorporated as the Masonic Tmple, Limited, capital $1,000,000. Only preliminary plans for building have been made, which call for five or more storeys, of brick and stone structure. Provisional directors, G. S. May, W. Northwood, H. W. Wilson, merchants; R. W. Stephen, deputy clerk in the Senate of Canada.

Mayor Hopewell is quoted as having said that the council will begin at once on the improvements to the City Hall.

Port Arthur, Ont.

E. Brotherton, of Indian Harbor, Ind., it is reported, has been engaged to prepare plans for a public library to be erected at a cost of $25,000.

Strathcona, Alta.

The Massey estate, of Toronto, has donated $50,000 towards the erection of a Methodist theological college on the University grounds. The collöge will be built next summer at a cost of $100,000.

St. Jacques L'Achigan, Que.

Mr. D. A. Lafortune, K.C., M.P., is stated as having said that he had secured $15,000 for the erection of a local post office.

St. Sylvester, Que.

J. W. Gregoire, architect, 95 Wellington street, Sherbrooke, Que., has under supervision the restoration of the interior of the church here. Approximate cost, $10,000.

St. Lambert, Que.

It is stated that work will be commenced in the spring on the erection of a new post office for this town, estimated cost $10,000.

Toronto, Ont.

The building committee of the Y. M. C. A. have reported favorably on a site on College street for their new building.

Vancouver, B.C.

The church committee of the Grandview Roman Catholic church have decided to erect a new church to replace the one damaged by fire recently. Father F. Lardon is in charge.

Architect Hooper has been engaged to prepare plans for the new Labor Temple. Plans to be submitted on January 13th. Estimated cost, $60,000. Materials: reinforced concrete, brick veneer and stone trimmings. Noted in issue of November 10th.

Victoria, B.C.

The ratepayers will be asked to vote on a bylaw to empower the corporation to grant to a local company a site for a theatre from the rear of the Empress hotel. Noted in issues of December 8th and November 3rd.

Woodstock, N.B.

Tenders addressed to J. C. Hartley, secretary-treasurer Carleton County, will be received until January 17th for furniture and fittings required in the new court house. Plans at office of the above mentioned, and of the architect, F. Neil Brodie, St. John, N.B.

Winnipeg, Man.

It is expected that a $50,000 permit for alterations in the old post office building on Main street will be issued shortly.

At the last meeting of the City Council a unanimous resolution was passed urging upon the Dominion Government the necessity of building a new drill hall.

Tenders are being invited for $200,000 4 per cent. 25-year school bonds. R. H. Smith, secretary-treasurer, Public School Board.

AWARDED.

Fort William, Ont.

The Separate School Board have awarded the contract for the erection of a new school building at the corner of Mary and Edward streets to M. Ferguson. Approximate cost, $16,000. Work will be started at once.

Strathcona, Alta.

The provincial government have awarded the contract for supply of brick required in construction of the Arts Building, Alberta University, to Pollard Bros., this city.

Woodstock, Ont.

The contract for tearing down the old section of the Beale school and for erecting in its place a four-roomed addition was let to the firm of Nagle & Mills, of Ingersoll, at $11,054, the lowest tender. Heating and plumbing systems are not included. The Delatre street school will cost $15,197, also exclusive of the heating and plumbing systems. The contract for this was divided up. Geo. Adams secured the masonry work at $8,300; Jas. Campbell, carpenter work, $5,672; G. Jarvis, slating, $527; Alex. McDonald, tinsmithing, $150.60; F. J. Fowler, painting, $390; J. W. Brown Bros., blackboards, $157.60. The contracts include clauses providing a penalty of $10 per day for each day the buildings are not completed after the time set. Work on the new buildings is to be commenced, according to the contracts, on April 1st, and the buildings are to be completed by September 1st, in time for the opening of the fall term.

Residences

Montreal, Que.

Plans are under way for the erection of a first-class modern apartment building on the Phillips property on Bishop street, next year, and as soon as spring opens the present houses will be torn down to make room for the new structure. The new apartment building will be built around a courtyard, and will be four storeys high with 70 feet frontage. The front will be of Roman stone and artistic design. The sale was effected by Cradock, Simpson Company.

Ottawa, Ont.

W. E. Noffke is preparing plans for a brick residence for P. G. Connally, M.D., of Renfrew, Ont., to cost about $12,000.

St. John, N.B.

Mr. Haley, 221 Germain street, will have a new residence built to be ready when he gives up possession of his present dwelling in the fall.

Toronto, Ont.

A three storey brick apartment house, to cost $14,000, will be erected on Foxbar road, near St. Clair avenue, by Mrs. E. D. Y. Cohen, 291 St. George street.

Winnipeg, Man.

Tenders are being called until January 22nd for all trades, except the excavations, for the erection and completion of a solid brick apartment block on Sherbrooke street. Plans, etc., at office of Smith & Bruce, the architects.

Recent building permits include: J. T. Bergman, apartment block, Furby street, $3,500; J. T. Bergman, three dwellings on Home street, $2,500 each; Geo. Neil, four dwellings, Aynsley, between Jessie and Rosser avenues, $2,000 each; F. Lovedale, dwelling, Glenwood screscent, $3,500.

AWARDED.

Montreal, Que.

Messrs. Hogle & Davis, 80 St. Francois Xavier street, have awarded the contract for roofing Mr. Greenshield's residence to D. Nicholson & Company, 690 St. Paul street.

Finley & Spence, arcihtects, 74 Guardian Building, have awarded the contract for alterations to residence at 552 Sherbrooke street for C. W. N. Aitken, to Leblanc & Aquin, cost $3,500.

Vancouver, B.C.

H. B. Watson, architect, has awarded the contract for the heating system for the apartment house, corner of Bute and Georgia streets, to Barr & Anderson, and that for the building construction to J. J. Dissette. Plans call for five storeys, brick and stone, covering an area of 66 by 132 feet. Estimated expenditure, $100,000.

Business Buildings and Industrial Plants

Arnprior, Ont.

The building occupied by I. Willoughby was destroyed by fire on or about the 2nd inst. Estimated loss, $5,000.

Brantford, Ont.

It is stated that the Goold, Shapley & Muir Company, Clarence and Wellington streets, are thinking of enlarging their premises. W. H. Whitaker, secretary-treasurer.

Chatham, Ont.

The ratepayers voted against the bylaw to grant a fixed assessment to the Chatham Fruit Growers' Association for the erection of a cold storage plant to cost $15,000.

Cowansville, Que.

The McClatchie block was destroyed by fire recently. Total loss about $15,000.

Davidson, Sask.

The American House was destroyed by fire on the 3rd inst. Estimated loss, $3,000.

Fort William, Ont.

The bylaw authorizing an agreement between Fort William and the Superior Rolling Mills Company has been carried. According to the agreement, the company is to erect a thoroughly up-to-date wire and nail factory, employing at least one hundred men for 250 days in the year at ten hours each day. F. W. Thompson, managing director of the Ogilvie Company; H. S. Holt, president of the Montreal Light, Heat & Power Company; T. Drummond, vice-president of the Dominion Steel Corporation are interested. Noted in October 20th issue.

Grenfell, Sask.

The building owned by the Grenfell Milling Company and the one occupied by R. B. Taylor were destroyed by fire on the 31st ult. Estimated loss, $10,000.

Gilbert Plains, Man.

Fire destroyed the Gilbert Plains grist mill and elevator on the 31st ult. Estimated total loss, $30,000.

Grandmere, Que.

The Robeson Process Company, of Ausable Forks, N.Y., will erect a large factory, this place, for the reclamation of waste sulphite liquors and other by-products in the tanning and foundry industries.

Inglewood, Ont.

The elevator here was burned. Total estimated loss, $5,500.

Kingsville, Ont.

The bylaw to grant tax exemption to Mettawas Hotel Company, who will build a $50,000 summer hotel here, was passed.

Little Current, Ont.

The potter building, occupied by J. Eliengton and E. Stephenson, the Mansion House and telephone and telegraph office, were destroyed by fire on the 10th inst. Total estimated loss, $100,000.

Minitonas, Man.

The brick building occupied by the Trading Company was destroyed by fire on the 3rd inst. Estimated total loss, about $10,800.

Moose Jaw, Sask.

It is reported that a large garage will be built early in the spring. Dr. McMillan is interested.

Montreal, Que.

Architect H. C. Stone, St. Francois Xavier street, is preparing plans for extensive alterations to the premises at 232-234 McGill street for the Childs Company, of New York. Estimated expenditure, $40,000.

Work will be commenced this week on the erection of an ice storehouse for the City Ice Company, on a siding of the C. P. R. at Mile End. The building has been designed by Mr. Shaw, of this company, and will also be erected by him.

The property, No. 357 St. Catherine street west, at present occupied by the Art Photo Emporium, will be taken over in the spring by Allan, the clothier, 401 St. Catherine street west, when alterations will be made.

The shoe factory and warehouse of Mr. M. E. Guay, 230 St. Marguerite street, were destroyed by fire. Total estimated loss, $4,000.

The premises occupied by H. Hart, 307 St. Lawrence street, were badly damaged by fire on or about the 6th inst. Total estimated loss, $5,000.

The plans for the new C. P. R. depot at Mile End, now submitted to the Railway Commission, call for a building 170 by 40 feet, with a platform 140 feet in length. Construction is expetced to start in the spring. Noted in issue of January 5th.

It is reported that the G. T. P. will erect a twelve storey office building at the southeast corner of St. James and St. Francois Xavier streets. It is also reported that plans are being prepared, and that an outside firm of contractors are likely to secure the contract.

The Roads Committee of the City Council recently approved of the erection of an East End terminal for the Lachine Jacques Cartier and Maisonneuve Railway. This new railway was incorporated at the last session of the Quebec legislature to operate between Lachine and Maisonneuve as a branch line of the G. T. R., and it is stated that it will be used ultimately for the G. T. P.'s entrance into Montreal. The Roads Committee have agreed to the closing of certain streets to permit the erection of the new station, which will be built on St. Catherine street, between Harbor and Frontenac streets. Noted in issue of December 29th.

It is reported that the C. N. R. Company will erect a large passenger station in the western end of the city on the block surrounded by Osborne, Mountain, Dorchester and Stanley streets. It is further stated that their lines from Toronto and Ottawa will be connected to this station, by tunnelling under the mountain, while eastern connection will be made by the construction of a line along the harbor front.

North Bay, Ont.

A number of stores on Oak street were destroyed by fire on the 7th inst. Total estimated loss, about $20,000. Those affected, Angus & Company, McCubbin and others.

North Vancouver, B.C.

The council have agreed to grant certain privileges to the Imperial Power Shipbuilding & Dock Corporation. The company will probably spend $300,000 on plant alone, and will enter into all kinds of railway construction.

Ottawa, Ont.

Colborne P. Meredith, architect, has prepared plans for extensive alterations to the Lemoine property on Sparks street, occupied by E. P. Charlton fancy goods store and Stroud Bros.

It is stated that the Beaver Manufacturing Company, of Beaver Mills, N.Y., are negotiating with a view to locating a branch factory here, to manufacture wood fibre, wall paper and wall boards. The site proposed is near the Booth mills.

According to a judgment recently issued by the Dominion Railway Commission, the C. P. R., G. T. R., and C. N. R. must, within fixed dates, construct and maintain buildings for freight and passenger accommodation along their lines of rail in Manitoba, Saskatchewan and Alberta.

Parry Sound, Ont.

The buildings owned by S. A. Sine were [illegible] ed total loss, $20,000.

Port Arthur, Ont.

The bylaw [illegible] Port Arthur [illegible] Company, of which J. B. Tudhope, Orillia, is president, has been carried. The report from Fort William is to the effect that the bylaws to bon[illegible] were defeated by a small majority.

Prince Rupert, B.C.

P. Burns, of Calgary, cattle buyer, is [illegible] age plant here with fishing station attached Estimated cost $1,500,000.

Portage la Prairie, Man.

R. H. M. Pratt, city clerk, writes that the oatmeal mill and two flour mills will enlarge their plants next season.

Regina, Sask.

D. W. Bole, ex-M.P. for Winnipeg, Man., is stated as having said that plans for a branch warehouse of the National Drug Company, of Montreal, are being prepared, and that the building will be ready, if possible, before 1911. F. H. Bole, of the Bole Drug Company, is also interested.

Sault Ste. Marie, Ont.

The buildings occupied by J. B. Straghearn and W. J. Thompson & Company were damaged by fire on the 4th inst. Total estimated loss, $8,000.

St. Boniface, Man.

A shoe firm of Quebec, which is anxious to secure a greater western trade, is contemplating the erection of a factory here.

Sackville, N.B.

F. G. Pickering and J. T. Cummings, of New Glasgow, have interviewed the Board of Trade with a view to establishing an industry here to manufacture the roller bearing wheel, of which the first named is the inventor.

Sydney, C.B.

The ratepayers voted in favor of the establishment of the National Rolling Mills. Construction of the buildings will, it is expected, start early in April. Estimated expenditure in material, $550,000; in wages $150,000. The company is comprised of H. McArel, of Glace Bay, C. V. Wetmore, H. Mitchell, of Dominion, and F. A. Srowell, of Sydney. Noted in last issue.

Toronto, Ont.

The site formerly occupied by Harold A. Wilson at 35-37 King street west has been sold. It is understood that a large business building with stone front will be erected. H. H. Williams effected the sale.

Victoria, B.C.

Construction of a handsome hotel for Queen Charlotte will be begun shortly. It is to be a two storey structure, with 30 guest rooms.

Vancouver, B.C.

It is stated that fifty thousand dollars has been appropriated by the Royal Bank of Canada for the remodelling of its Vancouver premises.

Work of tearing down, preparatory to excavation, has been started on the 10 storey office building to be erected. Estimated expenditure, $150,000. Mr. W. Holden is interested.

Windsor, Ont.

It is stated that a contract adding a third automobile factory to the local in[illegible] panies are branches of Detroit concerns.

Welland, Ont.

The International Tool Steel Company, Limited, having on its directorate such well-known men as Mr. John J. Main, gen[illegible] Limited; Mr. J. E. Murphy, lumberman, and Mr. Manson Campbell, president of [illegible] of mineral sands found in the Province of Quebec. It is reported that the plant may be located here.

Winnipeg, Man.

It is stated that Clare & Brockhest, [illegible]

[illegible] of Preston, Ont., have secured a building site for a warehouse. G. A. Clare, M.P., is interested.

J. T. Gilmore, representative of the Marshall Field Company, Chicago, writes us [illegible] company's plans do not at present embrace any location of [illegible] elsewhere. Noted in last issue.

Yorkton, Sask.

Wilton Bros.' wholesale fruit warehouse was destroyed by fire on the 5th inst. Estimated loss on building, $5,000.

AWARDED.

Medicine Hat, Alta.

J. O. [illegible], manager, Alberta Clay Products Company, Webster City, Iowa, U. S., writes that the following contracts for the clay products plant in this city have been let: E. Leonard & Son, London, Ont., boilers; Murray Iron Works, Burlington Sound engine; Bromnell Company, Dayton, Ohio, heater; National Pump Company, Upper Sandusky, Ohio, pump; Stewart Machine Company, Winnipeg, Man., 42 inch gap lathe, iron planer, 30 inch drill press, 5 horse power gas engine, blower and blacksmith tools; Minneapolis Steel Machinery Company, Minneapolis, Minn., post caps, base plates, I beam, heavy line shafting, bore and drum pulley. Contracts for sewer pipe machinery and equipment and structural steel for elevated track have not yet been awarded.

New Westminster, B.C.

The Vulcan Iron Works has secured the contract to supply large and expensive boilers and other machinery for the Williamette Iron Works Company, of Portland.

Orillia, Ont.

Phillips & Company have received the contract for the plumbing of the big Tudhope factory. The contract includes nine [illegible] lavatories, three on each flat.

Victoria, B.C.

The contract for the erection of the "Times" new building, on the corner of Broad and Fort streets, has been awarded to Adkinson & Dill, at about $70,000. Plans call for a building of five storeys with basement, of reinforced concrete, faced with pressed brick, the lower storeys being faced with sandstone and granite. Architect, H. S. Griffith.

Power Plants, Electricity and Telephones

Belleville, Ont.

The bylaw to grant the Trenton Electric & Water Power Company a five-year franchise was carried. This was erroneously reported as relating to Kingston.

Chatham, Ont.

The Board of Railway Commissioners has authorized the Chatham, Wallaceburg & Lake Erie Railway Company to construct and operate a branch line on several streets in this city.

Hamilton, Ont.

The Hamilton Street Railway Company have placed an order with the Ottawa Car Company for nine double-truck cars to be ready by June 1st.

Niagara Falls, Ont.

It is stated that the proceeds of the bonds issued by the Niagara Falls Power Company, amounting to $404,285, are to be used on additions to the plant of its auxiliary company, the Canadian Niagara Power Company.

Application has been made to the Dominion parliament by the Niagara Falls, Welland & Dunnville Electric Railroad Company for permission to construct an electric railroad from Niagara Falls, Ont., to Dunnville, a distance of about 50 miles. Franklin S. Buell, of Buffalo, N.Y., is interested.

Peterborough, Ont.

The Canadian General Electric Company are in the market for the supply of large steel castings far dynamos.

Port Credit, Ont.

As Brampton has decided to take power from the Government commission, it is probable that a sub-transformer station will be built here.

Preston, Ont.

The ratepayers will be asked shortly to vote on the question of raising $18,000 by debentures for the establishment of an electric power distribution plant. H. C. Edgar, clerk. Noted in last issue.

Regina, Sask.

The council has decided to advertise that the city is prepared to consider proposals relative to the granting of franchises for the operation of street railway and gas works, subject to the right of the city to take over the undertakings at the expiration of a definite term of years at a realization to be fixed by arbitration and subject to conditions with regard to charges to be made by the company's outsanding franchises.

The city invites negotiations with capitalists and others, for the purpose of obtaining proposals for a special franchise for street car services and gas works for the city, subject to the right of the city to take over the undertaking at the expiration of a definite term of years, at a price to be fixed by arbitration. Angus Smith, City Engineer.

Victoria, B.C.

The contract system will be followed by the city in carrying out the scheme for a system of ornamental lights which are to be erected on Douglas street between Humbolt and Cormorant, and on Yates street between Douglas and Blanchard streets.

The B. C. Electric Railway Company has taken option on Douglas street property lying between Discovery and Chatham streets, to be used as site for terminals. Messrs. Grant & Lineham put through the deal.

Waterloo, Ont.

It is stated on good authority that tenders will be called shortly for electrical equipment for the proposed municipal electric plant. Contracts for the construction of the power house have been awarded. Geo. Grosz, this place, is engineer; Ford S. Kumpf is secretary of the light commission.

AWARDED.

Montreal, Que.

The Montreal Light, Heat & Power Company recently awarded the contract for the installation of additional units in their Lachine power house as follows: Canadian General Electric, four 800-kw. generators, four 2,000-kw. transformers, and switchboard equipment. S. Morgan Smith Company, York, Pa., four vertical type water wheels.

The Canadian Light & Power Company have awarded the contract for the supply of three 7,200 horse power water wheels to the S. Morgan Smith Company, York, Pa., U. S. A. These will be direct connected to 4,000 kw. generators which are being supplied by the Allis-Chalmers-Bullock, Limited. The Smith Company will also supply two 450 horse power exciter water wheels which will be direct connected to 250 kw. direct current exciters also supplied by the Allis-Chalmers-Bullock, Limited.

The Canadian Light & Power Company have awarded the contract for penstocks required for their St. Timothee development, to the John Inglis Company, of Toronto.

Verdun, Que.

The contract for the electric wiring in connection with the Municipal Electric Light plant has been awarded to W. J. O'Leary & Company, whose tender was for $205. This company was also awarded the contract for the conduit work and for installing the exciter and generator leads at $145.

Vancouver, B.C.

The contract for excavating and concrete work for the new lighting system on Granville street, has been secured by Scott & Ledingham. The installation of the electrical work has been let to the Electrical Construction Company, and the Canadian General Electric Company have the contract for the lamp standards.

Winnipeg, Man.

Nelson & Cassidy, of this city, have been awarded the contract to supply the Manitoba government with 150,000 telephone poles. Estimated expenditure, $200,000.

Miscellaneous

Belleville, Ont.

The barns owned by John Huffman on the fifth concession of Thurlow, were destroyed by fire at a loss of about $5,000.

Fredericton, N.B.

Tenders for lumber for Tobique Narrows steel highway bridge will be received at the Department of Public Works, Fredericton, until January 17th. Specification to be seen at Public Works Department, Fredericton. John Morrissy, Chief Commissioner.

Kingston, Ont.

The ratepayers have passed the bylaw for purchase of fire engine and extension of streets. Erroneously reported as referring to Belleville.

London, Ont.

It is understood that a proposition is on foot to dredge the river to Springbank.

Montreal, Que.

Tenders addressed to L. O. David, city clerk, will be received until January 17th inst. for (1) uniforms; (2) for hose and covers; (3) for steam fire engine; or (4) for aerial ladder truck, as the case may be. Specifications, etc., at the office of the chief of the fire department, corner of Craig and Chenneville streets.

Recent building permits include: — Jenkins Bros., 103 St. Remi street, factory and office, $5,000; Chas. Boon, 492 St. Charles Borromee street, house containing four dwellings on St. Urbain street, $4,000; Jos. Rinfret, 5916 Berri street, house containing five dwellings, Delormier avenue, $6,000; Deguise & Cloutier, 1890 St. Catherine street east, two houses containing four dwellings, 168 Forsyth street, $4,000; F. A. Pinoteau, Parc Lafontaine, two houses containing four dwellings on Christopher Colomb street, $4,000; A. Beaulien, 224 Boyer street, a two storey house, 607 Mentana street, $3,000.

Toronto, Ont.

Tenders will be received until January 18th for the supply of limestone dust for

Tenders and For Sale Department

City of Wetaskiwin, Alberta

Sealed tenders will be received by the undersigned up to FEBRUARY 15TH, 1910, for the drilling of a Gas Well in the City of Wetaskiwin, at so much per foot.

A certified cheque for $500.00 must accompany each bid.

The lowest or any tender not necessarily accepted.

Specifications and form of tender may be received from

E. ROBERTS.
Secretary-Treasurer

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The Simcoe Railway and Power Company, Limited, Midland, Ontario

Tenders for Hydraulic and Electrical Equipment

Sealed tenders endorsed "Tender for Hydraulic Equipment," or for other respective sections, will be received by the Secretary of the Simcoe Railway and Power Company, Limited, at the Head Office, Ontario, until February, 1st., 1910 for the following:—

For Generating Station at Big Chute, Severn River.
- Hydraulic Equipment
- Penstocks
- Electrical Equipment

For 27 Mile Transmission Line
- Wire
- Insulators
- Crossing Towers

For Receiving Station at Midland
- Electrical Equipment

Specifications for the above may be seen at the office of the Secretary, Midland, Ontario, or at the office of Engineers, C. H. & P. H. Mitchell, Traders Bank Building, Toronto, Ontario. No tender necessarily accepted.

W. FINLAYSON,
Secretary.

Midland, January 6th, 1910. 4

1910. G. R. Geary, Chairman, Board of Control.

Recent building permits include: Chas. Simmons, alterations to pair of dwellings, 128 Edward street, $4,000; Geo. Jackson, Jr., two and a half storey brick dwelling, 254 Dufferin street, $2,500; T. P. Hodgson, 10 attached two storey brick dwellings, Dingwall avenue, $18,000; F. Sharp (in trust), pair two storey brick dwellings, Bloor street west, $4,800; W. N. McEachren, pair two storey brick dwellings, Wineva avenue, $4,000; Geo. Rennie, two pair semi-detached brick dwellings, Garden avenue, $12,000; Lake Simcoe Ice Company, Limited, two storey metallic siding stable, Esplanade street east, $2,000; H. J. Rae, two storey brick dwelling, Spencer avenue, $5,500; Mrs. E. D. Cohen, three storey brick apartment, Foxbar road, $14,000; G. S. Hope & Son, pair two storey semi-detached brick dwellings, Dovercourt road, $5,000; Toronto Bedding Company, three storey mill construction addition to bedding factory, Jefferson avenue, $21,000; C. B. Hodgson, two pair two storey semi-detached and one detached dwelling, St. John's road, $10,000.

Wnnipeg, Man.

The Board of Control recently awarded to the Fort Frances Lumber Company the contract for a million feet of lumber. Owing to a wrong quotation in figures, a revision of contracts will probably be necessary. The contract called for 700,000 feet plank, 150,000 feet culls, 150,000 feet miscellaneous. Tenders for this were received from three firms, as follows: D. E. Sprague, $22,637.50; T. D. Robinson, $21,175; Fort Frances Lumber Company, $20,430.

AWARDED.

Montreal, Que.

Mr. Theo. Daoust, architect, 113 St. Francois Xavier street, has awarded the contract for the erection of the Ice Palace to Corriveau & Brunett. Estimated cost, $6,300.

Messrs. D. Nicholson & Company, 697 St. Paul street, have been awarded the following contracts for roofing: Two houses on Grosvenor avenue, Westmount, for Mr. Kerr; architects, Ross & McFarlane; house for Mr. J. Ash, McDougall avenue, Outremont; architects, Wright & Son; house for Mr. Champagne, Letourneau avenue, Maisonneuve; filter house for the St. Lawrence Sugar Refining Company; and two houses on St. Catherine street west, for Sir Thos. Shaughnessy, architects, Wright & Son.

Blistering and Peeling of Paint on Frame Houses

One of the complaints occasionally met in connection with the painting of frame houses is that the paint blisters and peels from the outside of the buildings—in some cases peeling clear to the wood. This is attributed in a measure to bad priming and painting when the wood is green or damp, and in some cases it is found that ready-mixed paints applied by inexperienced workmen cause a great deal of trouble to the man who does the repainting. A Canadian correspondent, writing to a recent issue of the "Painters' Magazine," asks the best way to avoid this blistering and peeling when the old painted surface is done over with good material by practical and experienced hands. He says he is burning off all the blistered paint, but is afraid he may have trouble with the balance where the paint appears to be in good condition.

In reply to the above correspondent the authority in question says:

We fully agree with you that much of the blistering and peeling is due to green or damp wood and inferior material for priming. The old fashioned notion that anything is good enough for priming is still in the minds of many, but it is like building a house on sand without piling. Boiled or fatty oil has no place in a priming paint for wood nor should a priming be stout.

There is nothing better than pure lead and well settled but not fatty oil, mixed fairly thin and without driers for new work, and such prime should be rubbed in well into the dry wood. Over such a priming, paint is not likely to blister or peel, unless there are some local defects in the surface or behind it, such as plastered in damp weather, leaky gutters on roof, etc.

In repainting old-painted exterior surfaces, as an act of precaution the painter should, before he undertakes the job, assure himself of the actual condition of the old paint, which may appear to be solid and intact all over and yet, where the new paint has been applied over it for six months or a year, loosen its hold, taking the new paint with it and coming off in large blotches. A tap here and there on the old paint will tell whether it is adhesive and solid or whether it is loose.

The new paint cannot penetrate through the old paint and fasten it to the surface; on the contrary, in contracting on drying it is liable to draw it away still more from the wood, especially when the priming has been inferior. We would advise you to remove all of the old paint, either by burning or scraping.

Notes on Concrete Work

Objections are often heard as to the unsightly appearance of concrete buildings when finished. With a little care concrete structures may be made as beautiful to the eye as buildings built of any other material. Concrete work is subject to various sorts of surface imperfections, the two most common being irregular surface texture and variability of color, or discoloration. When these are successfully avoided or eliminated by the concrete worker he is within reach of producing a satisfactory finish.

Plastering as a method of obtaining this finish is emphatically condemned by most authorities, who declare that it is practically impossible to apply mortar in thin layers to a concrete surface and make it adhere for any length of time and when it once begins to scale off, the result is a surface many times worse in looks than the unfinished concrete that it was intended to render more sightly.

A method of finishing concrete surfaces which is preferred by many experienced engineers is to dress the concrete after it has hardened, by means of hammers or pointed chisels. This process is very similar to stone dressing and any of the forms of finish employed for cut stone can be employed equally well for concrete. In connection with tooled surfaces, it is common to mould the concrete to represent Ashlar masonry, by means of horizontal and vertical recessed joint lines. This style of finish has been extensively used by Ransome, who gives the following directions for securing it: In imitating rough dressed work the mould is removed from the concrete while it is yet tender and with small light picks the face is picked over with great rapidity, an ordinary workman finishing about a thousand square feet a day.

For imitation of finer tooled work, the concrete should be left to harden longer before being spalled or cut and the work should be done with a chisel. Most natural stone and especially granite makes excellent material for a face, but ordinary gravel will do.

Whatever is used let it be uniform in color and of even grade. When a very fine and close imitation of natural stone is desired take the same stone, crush it and mix it with cement colored to correspond. The finer the stone is crushed the nearer the resemblance will be upon close inspection, but for fine work it is generally sufficient to reduce the stone to the size of buckshot or fine gravel.

Cement Piant for Steel Structures

It is claimed by Prof. F. E. Geisecke, of the Agricultural and Mechanical College of Texas, after a series of experiments, that a coating of neat cement paint applied to structural steel before it is used in the construction of a building will prolong the life of the steel and will bring about a better adhesion than if other treatment were used.

Mr. Geisecke supervised the new engineering building and the building for the Texas experiment station. In both of these a large amount of structural steel was used, and he made the experiments referred to on this account, and also in the nature of scientific research.

Mr. Geisecke says that in reinforced concrete construction, where small bars or rods are used, it is comparatively easy to cover the same with concrete, but when large beams are to be covered this is much more difficult, partly because it is difficult to make the concrete run so as to fill all cavities between the forms and the steel and partly because the larger beams are exposed to the weather for a considerable time before the concrete can be poured and are therefore apt to be partially covered with scales of rust, which prevent a contact between the concrete and the steel, and which may act as carriers for carbon dioxide and moisture, thus producing a continuation of the rusting process under the concrete coating. It is, therefore, desirable to coat the structural steel before it has begun to rust thoroughly with some material which prevents rusting and which has no injurious effect on the adhesion between the concrete and the steel.

On June 3rd, of 16 steel rods ⅝ of an inch in diameter and about 18 inches long, four were painted with red lead, four with boiled linseed oil, four with neat Portland cement, and the remaining four were not treated. The painted rods were allowed to dry in the shade for one week and then each rod was placed in a cylindrical tin can so that one end projected about one inch through a hole in the centre of the bottom. The cans were then filled with concrete of 1 to 3 and stored in a shaded place, where the concrete was allowed to set.

When the concrete was one week old one-half of the specimens were tested in an Olsen testing machine by pulling the steel rods. The adhesion was found to be, expressed in pounds per square inch: Oil coated rod, 34; red lead coated rod, 68; uncoated rod, 136; cement coated rod, 170. The remaining specimens were tested when the concrete was nine weeks old, and the following adhesion was found: Red lead coated, 38; oil coated, 72; uncoated rod, 170; cement coated rod, 465.

It appeared from these tests that the adhesion between steel and concrete was materially increased by coating the steel with neat cement. The test of the first four specimens showed that a coating of oil and one of red lead had very injurious effects upon the adhesion between the steel and the concrete. In this experiment, however, the red lead paint had been allowed to dry for only one week.

Mr. Geisecke, therefore, tried another test, and on June 19th four rods were painted with red lead and allowed to dry for two months. On August 9th, eight rods were painted with neat cement. Four of these were placed in the shade to set and four were exposed to the weather. On August 18, these twelve rods and four which had not been treated were embedded in concrete as described above. When the concrete was one week old, eight of the specimens were tested and th adhesion found as follows: Red lead coated rod, 9 and 4; uncoated rod, 160 and 190; cement coated in the shade, 190 and 210; cement coated exposed to weather, 160 and 390.

At one month old four specimens were tested as follows: Red lead coated, 17; uncoated rod, 220; cement coated rod in shade, 410; cement coated exposed to weather, 390. At two months old specimens were tested and the adhesion found: Uncoated rod, 254; cement coated rod in shade, 272; cement coated exposed to weather, 305. The fourth rod, painted with the red lead, was damaged.

Mr. Geisecke deduces, first, that the adhesion in the case of the red lead coating is not increased by allowing a greater period of time for the drying of the paint; second, that the adhesion, in the case of cement coating, is not affected injuriously by exposing the coated steel to the weather. It was found that the best results can be obtained if the cement coating is moistened repeatedly for several days by either rain or dew or an artificial spray of water.

If the adhesion between concrete and uncoated steel is taken as a basis, it is evident: 1, that the adhesion is reduced about 90 per cent. by a coating of red lead; 2, that the adhesion is reduced about 80 per cent. by a coating of linseed oil; 3, that the adhesion is increased about 35 per cent. by a coating of neat cement.

Mr. Geisecke estimates that for sizes and shapes commonly used and which represents average values, the cost would be about 63 cents per ton, a little less than 1 per cent. the cost of structural material erected in the building.

Bonding New Concrete to Old

Clean off with clear water and stiff broom the surface of the old concrete. Mix one part commercial muriatic acid or hydrochloric acid and three parts water, make several applications one after another with a brush containing little or no metal. This will not injure the concrete, as the acid does not sink to a sufficient depth before it is neutralized.

This will have the effect of removing the cement from the top surface of each grain of sand or piece of stone and the other aggregates that may have been used, exposing the clean surface of these aggregates in exactly the same condition as they were before being mixed.

After applying the acid, wash the surface with clear water, scrubbing with a stiff broom or brush, removing all the dead particles. While the surface is still wet (and it should be thoroughly wet), apply the new concrete. Protect this new concrete by keeping it damp for at least a week. Do not let it dry out at any time during the first week.

It will be found that the new concrete will bond to the old as strongly as if both had been mixed at the same time.

The Ontario members of the Canadian Manufacturer's Association, connected with industries pertaining to engineering, are to be entertained at the 21st annual dinner of the Engineering Society of the Faculty of Applied Science of the University of Toronto, to be held on Wednesday, Jan. 18th. The members of the Ontario Cabinet and of the University Board of Governors will also be guests of the society.

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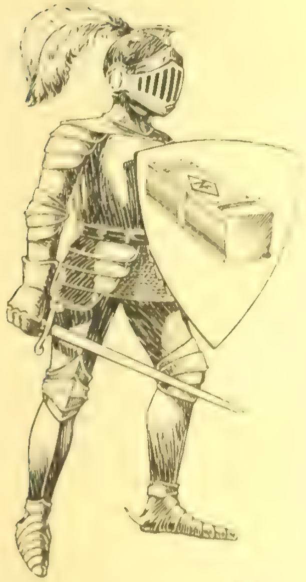

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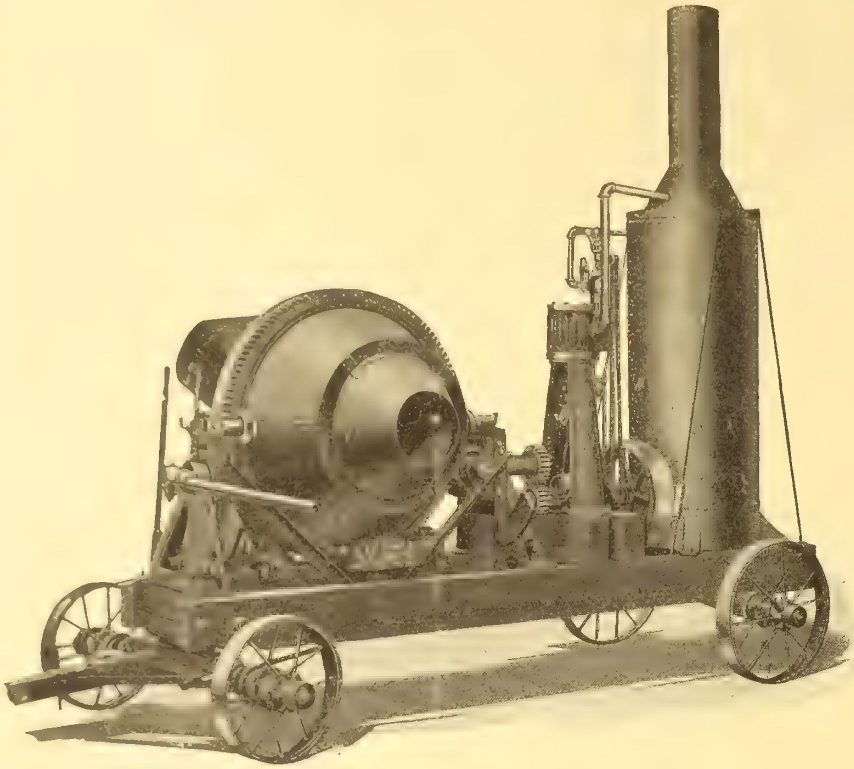

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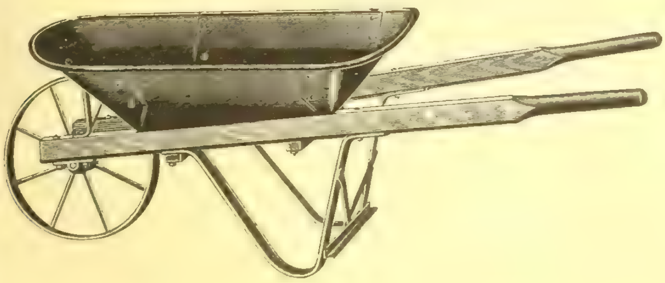

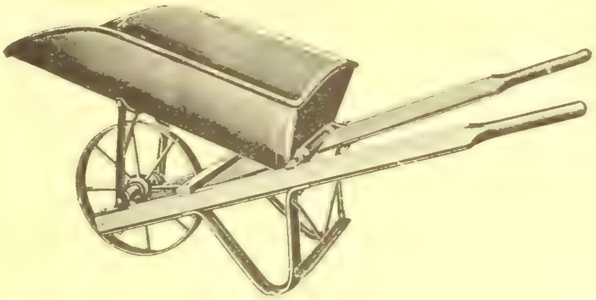

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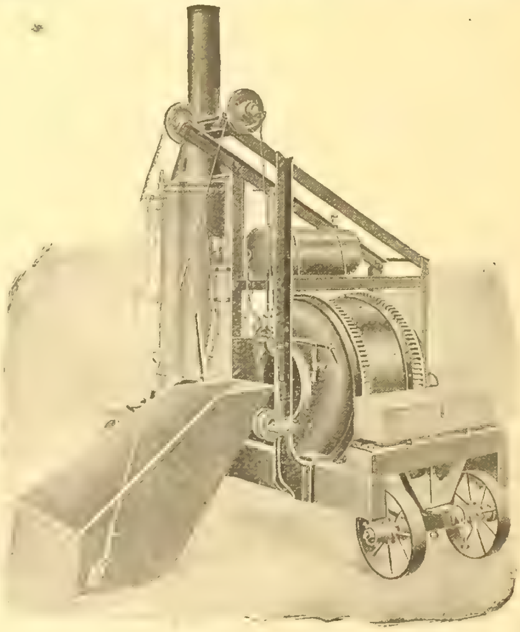

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Success Begets Confidence

The year which has just passed into history witnessed steady development and gratifying progress in all parts of the Dominion. Building returns are a pretty fair barometer of a country's progress, and these cannot be considered other than most satisfactory, particularly so when it is borne in mind that 1909 was by no means a "boom year." Returns from the more important cities and towns of Canada, published elsewhere in this issue, reflect healthy growth in all parts of the country. After all, these developments are only what, in a measure are to be expected, considering the particularly favorable circumstances in which we are placed. The progress recorded in all sections reflects the steady natural growth of the country and does not owe its existence to any unnatural inflation.

*

The record of 1909 is additionally satisfactory when it is remembered that the tendency in the opening stages of the year was one of considerable cautiousness. The period of depression had not been forgotten. The impression still remained, and the general tendency was to spy out the land before making any ventures. With the development of the year, however, and assurances of returning prosperity coming in thick and fast, combined with the prospect of an unusually good crop, greater confidence soon became manifest. This confidence was augmented much more rapidly upon the materialization of those prospects and the harvesting of a crop which provided the people of the West with about $150 per capita.

*

The position we have now reached is, or should be, one of confidence. This is no small asset, and having attained it at the very outset, the year 1910 at once has a lead over 1909. It would require no far-sighted prophet to make a glowing prediction for the current year. The ability to do so is about on a par with the amount of skill required to compute the addition of two and two. If we are lacking in any outstanding particular, it is in a proper appreciation of our opportunities. If there is one means by which we can make 1910 the best ever, it is by a practical demonstration of that confidence in our country which we should all feel. This confidence is not to be taken as including rash speculation and foolhardy ventures, but the sane and legitimate investment of available capital as occasion arises, and the setting apart and employment of a reasonable proportion for development work, to enable us to cope with the demands of the future.

*

1909 closed with a record of industrial progress of which the country might well be proud. Whether its achievements will be surpassed during 1910 rests largely with ourselves.

Railroad Expansion During 1909

The year 1909 was one of the best in the history of Canadian railroads. The story of progress may be read elsewhere in this issue. Too much importance cannot be placed upon what is accomplished each year by the railway companies. The figures for 1909 cannot be regarded other than most satisfactory. The greatest expansion was, as might be expected, west of the Great Lakes, where steel was laid on nearly 1,200 miles of new line. One of the most interesting works of the year was the completion of the Lethbridge viaduct, the construction of which was recently described and illustrated in this journal.

Signs of the Times

In this number will be found an article from a recent issue of the "London Statist," in which the editor of that conservative journal predicts prosperous times for Canada. Analyzing conditions carefully, the writer finds that the factors which ensure prosperity are the country's great resources of natural wealth, the availability of a practically unlimited amount of capital at low rates of interest, the ability and shrewdness of our legislators and the world's special need of new sources of food supplies. Another factor favorable to Canada is the extent to which the resources of the United States are developed, while the ability of the country, which is almost unique, to make free grants of fertile land, is also most significant.

*

Mr. Paish, the writer in question, knows of what he writes—and his knowledge was not obtained from emigration pamphlets. He has visited both eastern and western Canada and, unlike the general run of old country newspaper men, has received deeper and more valuable impressions than are to be obtained from a Pullman car.

What is the object of such articles as these, if not to bring home to the people of the Old World a keener realization of the opportunities of the New? Whether we Canadians are alive to the signs of the times is the question. Whether we contribute our quota to helping the country and developing its resources is our responsibility.

It is not really worth while to take a job unless there is a fair profit in it. Certainly, it is better to lose new business than to lose money already made on old business.

1909 Building Statistics 1910 Forecasts

Principal Cities and Towns of the Dominion make Good Showing Great Hopes Held Out for the Coming Season

The accompanying returns furnish incontestable evidence of the country's progress. That was the main object in their compilation. While the list is not intended as a complete statement, figures are given from the principal centres of activity throughout the Dominion, and these will doubtless be found to serve the purpose.

With the exception of Halifax, N.S., in which city the conditions were somewhat unusual, as explained elsewhere, all the returns show a substantial increase over those of 1908. Of the eastern cities, Kingston and Ottawa record the greatest gains over the preceding year, the percentage of increase being 165 and 152 respectively. While it is only fair to make primary mention of these figures, Toronto's record of an increase of 54 per cent., over a total of nearly twelve millions for 1908, is easily the most significant feature of the eastern returns. By rather a strange coincidence, the city of Montreal also shows a gain of 54 per cent. The return of nearly fifteen million dollars for greater Montreal is eminently satisfactory, and augurs well for the future expansion of the Quebec metropolis. Adverting to Ontario, we find substantial gains at Berlin, 128 per cent.; Fort William, 90; London, 83; Brantford, 51, and Peterborough, 44. Welland has a showing which is worthy of note. Three-quarters of a million dollars expended in new buildings during one year is a record which many a larger town in the Dominion will covet.

To the West we naturally look for great things. Thinking at once of Winnipeg, Man., we find an increase over 1908 of 67 per cent. The proportion of this increase reflects in a fair measure the growth of the entire prairie section.

To Saskatoon, Sask., falls the honor of the star performance of the whole of Canada. In this progressive city the percentage of increase for 1909 over 1908 was no less than 720. The word phenomenal may well be applied in this case, but Saskatoon is well favored in many ways and is going ahead on its merits. With a continuation of the favorable conditions hitherto enjoyed, and with a materialization of present prospects, this enterprising little city should give another good account of itself at the end of 1910.

Another good record is that of Calgary, Alta., where an increase of 189 per cent. was made. Here the figures jumped from $837,100 to $2,420,452. The greatest optimism prevails at Calgary and those competent to express an opinion declare that the prospects for 1910 are unparalleled in former years.

An increase of 56 per cent. at Regina, Sask., attests to most encouraging progress in that city. At Vancouver, B.C., the most optimistic predictions were fulfilled. A total of over seven million dollars, with an increase of more than one million dollars over the total for 1908, is highly satisfactory and is an indication of gratifying confidence in the future of the city. From Vancouver it is a near cry to Victoria, where an increase of 48 per cent. is recorded.

The average gain, computed from the returns submitted, is 59 per cent. This may safely be taken as a representative figure for the whole of Canada.

These figures cannot be other than eminently satisfactory to those interested in development work throughout the Dominion. If the general tone of the forecasts submitted in connection with these reports can be taken as a criterion, the feeling in regard to 1910 is one of the most sanguine expectation. In the principal centres of activity, a great amount of work is in prospect, and with a reasonably early spring this should give the building industry a good impetus for a record year.

Town or City	No. permits 1908	No. permits 1909	Total Value 1908	Total Value 1909	Increase per cent. (approx.)
Toronto	3,921	5,056	$11,795,436	$18,154,047	54
Winnipeg, Man....	1,769	2,942	5,513,700	9,226,325	57
Montreal, Que.	1,807	2,431	5,062,326	7,783,621	46
Montreal Suburbs:					
Ville St. Louis.	....	....	....	2,100,000	
Westmount ...	....	....	....	1,417,600	
Maisonneuve ..	....	....	....	1,200,500	
Outremont	....	....	....	918,500	
Verdun........	....	....	....	722,000	
Notre Dame de Grace..	....	....	....	345,000	
Ville St. Paul.	....	....	....	248,300	
Delorimier	....	....	....	236,500	
(Greater Montreal)	....	....	....	14,972,021	
Vancouver, B.C....	1,697	2,050	5,950,893	7,258,565	22
Ottawa, Ont.......	507	682	1,794,075	4,527,590	152
Fort William, Ont.	319	729	1,560,835	2,970,365	90
Calgary, Alta.....	423	777	837,100	2,420,452	189
Edmonton, Alta...	689	863	2,549,847	2,118,386*	
Victoria, B.C......	570	573	1,130,740	1,673,420	48
Hamilton, Ont.....	623	730	1,331,182	1,547,425	16
Saskatoon, Sask...	72	275	115,625	947,905	720
London, Ont.......	234	684	464,180	850,134	83
Regina, Sask......	253	278	476,656	744,479	56
Welland, Ont.....	....	....	....	703,600	
Moose Jaw, Sask..	....	....	....	675,440	
Halifax, N.S.......	637	548	838,725	630,380	25†
Kingston, Ont.....	396	482	170,600	452,695	165
Brantford. Ont....	306	307	289,855	438,885	51
Windsor, Ont.....	166	176	297,780	421,385	42
Brandon, Man.....	134	173	291,864	346,200	19
Peterborough, Ont.	245	228	238,963	343,489	44
Berlin, Ont........	40	112	121,350	276,550	128
St. Thomas, Ont..	140	139	236,000	260,000	10
Medicine Hat, Alta.	88	108	138,072	228,168	66
Moncton, N.B.....	....	91	....	200,000	
Portage la Prairie, Man.	....	....	120,000	195,000	63
St. Andrews, N.B.	9	8	65,000	176,000	171
Sydney, N.S.......	40	90	67,015	159,270	138
Fredericton, N.B..	....	20	....	96,000	
Sydney Mines, N.S	...	....	....	100,000	
Niagara Falls, Ont.	20	27	60,000	80,000	33
Collingwood, Ont..	60	59	84,275	78,175	7
Lindsay, Ont......	13	24	22,000	38,000	73

*To end of November †Decrease

Toronto, Ont. — The total of over $18,000,000 for building operations during 1909 is exceptionally gratifying and is an indubitable tribute to the faith that is placed in the future of the city. Last year's total exceeds that of the preceding 12 months by nearly six and one-half million dollars. A considerable portion of the large amount was contributed by buildings of a very substantial order. Great preparations have been made on all sides for future extension and activity. The state of business and the outlook are most satisfactory. With a continuation of present conditions and a reasonable amount of confidence, the present year should witness even greater advances.

Mr. P. L. Fraser, secretary of the Toronto Builders' Exchange, interviewed by the "Contract Record," summed up the situation and outlook in the following terms: "Expectations of a record year in the building line are based on a strong, and what looks like a permanent, resumption of the business activities which marked the seasons preceding the panic of two years ago. The erection of new buildings depends on an increase in population and an extension of business — manufacturing, wholesale and retail. The present year promises a fulfilment of both of these conditions.

"In December, the Toronto Customs House reported a considerable increase over the business of the same month last year, which was the largest in the history of the city. This indicates that the wholesale and retail business is expanding rapidly, while the bank clearing house records are mounting up month after month In fact, Toronto is quickly overtaking Montreal in a commercial way. The entrance into the city of the Canadian Northern Railway opens up a new and important territory, tributary to Toronto, which will be supplied from this centre. An index to the down town building is contained in the number of properties which have changed hands during the past two months. Seldom, if ever, has there been such activity in down town real estate circles, and the erection of many large office buildings will be the result.

"There seems to be little doubt that the movement towards establishing Canadian branches of American factories will be a marked feature of the coming year Already a number of the largest manufacturers in the United States have arranged to build factories in Toronto during the coming summer. What has worked out so advantageously in the case of over two hundred who have already come, will, no doubt, encourage many others in the near future.

"The enlargement of the city through the annexation of new districts means the erection of new fire halls, schools and other public works.

"Last summer, several districts were laid out in building lots, and in most cases were sold to individuals who intend to build this season. Already a number of other residential districts have been marked out for sale during the coming spring. The readiness with which these lots are selling indicates a considerable activity in house building. In fact, there is every prospect of very extensive building. It is up to the supply men, especially the brick manufacturers, to be in readiness to meet the demand for materials when operations begin in the spring."

Winnipeg, Man. — 1909 was a good year in Winnipeg if the value of buildings for which permits were granted is a criterion. The total cannot be regarded otherwise than as a remarkable showing in view of the fact that the city, and the West in general, was just recovering from the period of depression which had affected the entire world.

The remarkable feature of this satisfactory aggregate is that it was swelled by no structure costing anything like a million dollars. The McArthur Building, costing between $400,000 and $500,000, was the biggest item in the list. The commercial buildings were largely of the convenient, compact type, fireproofly constructed and equipped and ranging in price from $40,000 to $150,000. These buildings are scattered in representative fashion over the principal business districts. The houses erected were very numerous, some districts having practically been built up during the year.

A comparison of the building figures in each year since 1899 is as follows:

Year.	Permits	Buildings	Cost
1900	530	658	$1,441,863
1901	630	820	1,708,557
1902	822	973	2,408,125
1903	1,227	1,593	5,689,400
1904	1,768	2,268	9,651,750
1905	3,349	4,099	10,840,150
1906	3,487	4,204	12,625,950
1907	2,433	2,827	6,309,950
1908	1,544	1,769	5,513,700
1909	2,497	2,942	9,226,325

The following statement shows the building figures by months for 1909:

	Permits	Buildings	Cost
January	37	47	$ 50,300
February	70	97	158,500
March	167	208	861,200
April	262	279	1,064,200
May	361	424	1,291,800
June	418	490	2,042,850
July	257	299	962,700
August	270	322	1,134,750
September	280	321	802,950
October	215	255	531,850
November	133	162	291,800
December	37	38	33,425
Totals	2,497	2,942	$9,226,325

The building operations of last year were induced by no boom or extraneous excitement. They were the result of real demand or conservative investment. The prospects of 1910 were never so bright. With the big building enterprises already under way and with others mooted, it is predicted in some quarters that the total for next year will reach $13,000,000.

The permits issued on Jan. 1st amounted to $64,000 This is nearly $14,000 in excess of the figures for the whole of January, 1909. The building department has plenty of evidence to indicate that the season of 1910 is to be a record one. Mr. Rodgers, the city building inspector, has before him for approval a pile of plans for new structures which represents more buildings than have ever been considered at this time in any previous year. One of these calls for the erection of a $300,000 apartment house.

Montreal, Que. — Building statistics supplied by Mr A. Decarie, of the building inspector's department, show a decided advance on the record of last year, and make a near approach to the big year of 1907. It was known all the summer that the record was going up all the time. The three building months are April, May and June, and during these months the total was over a million a month, which was invested in new buildings It should be remembered that these are the estimates of the architects' plans, which are always under the actual costs. Though the three months referred to were the busiest in the building trade, the succeeding months were by no means idle ones in that respect. The only month which fell under the half million mark from July to November was the last named month, when $420,850 was invested. December, for obvious reasons, is not a good month to build in. The record shows but $139,580. The general result of the year is highly satisfactory, and what is perhaps more significant, the an builders are most sanguine about the developments of 1910.

The following forecast is made by the Montreal office of the "Contract Record": "From almost every architect's office in the metropolis comes the report that work is proceeding apace on plans for structures to be built during the present year. To mention any of the contemplated erections would be repeating a list that has appeared in these columns before. That Montreal's building returns will be greater at the close of 1910 than ever before in the history of the city, is the natural conclusion of those who have made a study of the subject. With the opening of the new year the town of St. Louis became part and parcel of the city, thereby adding a new ward, whose additional figures alone will greatly swell the volume of the total, but aside from this impetus, there is every reason to believe from the recent outlook that Montreal's figures will be well above the average of other years."

Westmount, Que. — The statement of the year's building shows an appreciable increase over the figures for 1908. Previous years also show a steady increase—1903, $282,700; 1904, $350,000; 1905, $800,850; 1906, $763,600; and 1907, $893,600. The past year's total was made up of the following: Stables erected $17,500; alterations in buildings, $22,900; flats, $31,000; terraces, $185,000; semi-detached residences, $837,050; detached residences, $316,500; store tenements, $8,100.

Vancouver, B.C. — The total value for building operations in this city during 1909 exceeded by a million dollars the figures for 1908, which constituted the previous record. Investors are beginning to realize the exceptional advantages offered by Vancouver, and phenomenal developments may be expected during the next few years. Mr. S. H. Jarrett, building inspector, writes: "There is every indication that 1910 will be far ahead of the year just closed. Vancouver should pass the nine-million mark."

Ottawa, Ont. — Mr. R. Fotheringham, building inspector, in furnishing us with the statement of building operations for that city, states that it is rather early to make a forecast for 1910. Doubtless he thinks that a satisfactory augury may be made from the figures, which certainly reflect development of an enterprising and hopeful kind.

Fort William, Ont. — Mr. S. Macnamara, building inspector, writes that the outlook for all kinds of building in this city this year is excellent. In all departments of industrial activity during 1909 the city made a good showing. A big item in the 1909 total is the G.T.P. elevator, which has just been completed at a cost of nearly $1,000,000. This elevator has a storage capacity of 3½ million bushels, and is the first unit of what will ultimately be the largest elevator plant in the world. In 1909 more than double the number of residences were erected than in 1908. In this connection rental agencies report that the demand is still far in excess of the supply and that it is growing even more rapidly. If present plans are carried out, numerous industrial plants will be constructed at Fort William during 1910. A large wire nail and rolling mill plant is in prospect, and it is regarded as practically certain that the Northern Pyrites Company will build a large dock.

Calgary, Alta.—Mr. Richard Harrison, building inspector, indites four significant words in regard to the prospects for the current year: "Excellent. Never looked better." Following is a list of some of the principal buildings recently completed or now building: City Hall, $200,000; library, $70,000; Hull Block (reinforced concrete), $180,000; International Harvester, $80,000; Conrad Rohls business block, $40,000; Samis Block, $55,000; three fire stations, $18,000; Dick Block, $35,000; McLaughlin Carriage Company, $35,000; Mackie Block, $45,000; Young Women's Christian Association, $50,000; Calgary Paint & Glass Company, $40,000; elevator (Globe), $150,000; Lineham Block, $55,000; Brackman Ker Milling Company (grain tanks), $20,000; Calgary Wine & Spirit Company, $20,000; Calgary Saddlery, $20,000; Riverside Planing Mills, $180,000; Salvation Army Barracks, $18,000; Finlay apartment house, $20,000; proposed additions to Holy Cross Hospital, $80,000. Fifteen warehouses were erected at a cost of $278,640, and 617 private residences, at a cost of $1,033,350.

Edmonton, Alta. — Although the statement of 1909 operations for this city is not particularly striking, those who are best able to judge are more than satisfied with the developments of the city, and a bright forecast is made for 1910. J. D. MacKinnon, inspector of buildings, states that already $1,500,000 is contemplated in expenditure on new buildings during the current year.

London, Ont. — Mr. A. E. Nutter, city clerk, writes as follows: "If present indications are realized, 1910 will show a bigger improvement over 1909 than 1909 made over 1908. A feature of the permits issued during 1909 was that a large number of them were issued for improvements and additions to house property, the percentage of large building and public buildings being comparatively small."

Regina, Sask. — The City Engineer, Mr. Angus Smith, writes us as follows: "To the amount shown in the statement are not added the figures for the Government buildings which are being erected immediately on the city limits, in value, as per contract, $1,125,000 The prospects for 1910 are good in the building line Many parcels of inside property have changed hands lately, and these are taken up for the purpose of building; further, many residences will be built during the coming season.

Welland, Ont. — Mr. Geo. Ross, town engineer, provides us with a classification of the building operations carried out during 1909 in this progressive town. The items are as follows: Schools, $22,000; public buildings, $71,000; Government works, $60,000; municipal works, $51,800; business places, $35,000; railways, $19,000; industrial, $242,000; residences, etc., $202,800; total $703,000. The year 1909 was the second best building year Welland ever had and a very optimistic forecast is made for the current year. The largest item on the list for 1909 is the Page-Hersey Tube Works, which cost $150,000.

Moose Jaw, Sask. — 1909 witnessed remarkable activity in building circles at Moose Jaw, where during the past four years two million dollars have been spent in new buildings. Last year, 30 new business houses, from wholesale warehouses to small stores, were erected, and over 100 new dwellings. In the same period the C.P.R. made important extensions at a cost of over $50,000. This railroad has made plans for further extension this year. Rapid strides are expected to be made during 1910. All things considered, Moose Jaw may be regarded as one of the liveliest western cities of the year just closed.

Halifax, N.S. — The value of building work during the year 1909 was somewhat behind the total for 1908. This is accounted for by the fact that a great portion of the work for which permits were issued in 1908 was carried out last year. For instance, construction work on All Saints' Cathedral was only started in 1908, a greater portion of the work being carried out in 1909. This building still remains to be completed. The fall season was a particularly good one for building operations last year. Considerable work was done on residential building, some houses only have been started in October and November. According to present indications 1910 will rank with the busiest years in the history of the city.

Brandon Man. — Referring to the 1909 permits, figures for which are provided in statement, Mr. R. E. Speakman, city engineer, informs us that in addition to this total, about $150,000 was expended in civic improvements. Mr Speakman is enthusiastic over the outlook for 1910. Many important improvements are projected, among which may be mentioned the erection of a large hotel and a new depot by the C.N.R., additions to the C.P.R. depot, and the construction of 14 miles of new mains by the gas company.

St. Thomas, Ont. — Mr. J. P. Freek, building inspector, states that the prospects for 1910 in his city are very bright. Last year the city installed a septic tank system for the treatment of sewage at a cost of $40,000. Another work worthy of mention was a subway under the M.C.R. tracks at a cost of $65,000. Considerable improvements were also made in the way of new sidewalks, street pavements and sewers. Petitions have been submitted for some three miles of brick and Westrumite pavement.

Medicine Hat, Alta. — Mr. J. Baker, secretary-treasurer, is very optimistic about the prospects for 1910 He looks for the building permits of this year to double those of 1909.

Fredericton, N.B.—Mr. J. W. McCready, city clerk, informs us that the total given for 1909 does not include all the building operations of the year, as a good number of cottages and small residences were built around the outskirts of the city for which no permits were taken out. Of these the city authorities have as yet no record. "Speaking generally," writes Mr. McCready, "the new dwellings erected in 1909 exceeded both in number and value the same class in 1908, and for 1910 the outlook is even better than for some years past. Several applications are now before the city council for street extensions, in order to accommodate the expansion of the city and provide room for new homes. Plans and estimates are also being made for a new school building and it is understood that the erection of two factories for the manufacture of short lumber and other wood articles is under consideration."

St. Andrews, N.B. — This town has a good showing for 1909 and would appear to have prosperous times ahead. The figures for the past year include $85,000 for a large annex to the Algonquin hotel, to be completed early in 1910 at a total estimated cost of $85,000, and a power house costing $20,000. Other noteworthy items for 1909 were the C.P.R. wharf, costing $20,000 and the Government wharf costing [illegible]

Sydney Mines, N.S. — Every branch of business prospered during 1909 and the town made splendid progress. In the building line everything was brisk. The items for the year included a new brick school, costing $25,000, and the rebuilding of St. Mary's Hall at a cost of $10,000. Over 50 modern residences were erected, while several mercantile blocks were enlarged and improved. The chief civic undertaking was another section of the sewer system, the work done last year together with what was finished in 1908, bringing the total mileage at present up to 6½, and involving an expenditure of approximately $75,000. The year was the most successful in the history of the town's two big industries, the collieries and the steel plant of the Nova Scotia Steel Company. The output of coal at the collieries reached the record figures of 810,000 tons, as compared with 680,772 tons last year, while the production of steel was 68,000 tons, and iron, 58,000 tons. During the year, the company paid ou tin wages $1,715,378.82, as against $1,431,069 last year. The prospects for still greater business for the coming year are very bright.

Niagara Falls, Ont. — Mr. J. C. Gardner, city clerk, is looking for big things during 1910. In regard to the statement for 1909, he states that the figures are compiled from the most reliable information that can be obtained. No official building record has yet been started.

Collingwood, Ont. — Mr. J. H. Duncan, town clerk, looks for continued improvement during the current year. He states that finishing touches will be put on a number of buildings in the spring and that by the end of 1910 appreciable progress will have been made in the town.

Lindsay, Ont. — Mr. F. Knowlson, town clerk, writes: "It is generally believed that 1910 will be a good year for the town of Lindsay. Many improvements are contemplated and building will probably increase."

Woodstock, Ont. — Mr. John Morrison, city clerk, writes us as follows: "Our city has not adopted the system of requiring building permits. Building operations were not very extensive last year. The principal ones were the knitting factory, costing about $20,000, and the Tobin Arms factory, costing $12,000. A number of new houses were built and additions and repairs made to others. The coming year's prospects are good. Two new schools will be erected at a cost of $30,000, and several new buildings are contemplated."

Maritime Provinces Generally — In all the industrial centres of the maritime provinces extensive development plans are being made for the current year. In Cape Breton alone it is estimated that five million dollars will be expended in development work during 1910. The past year's business in general was very satisfactory. Building operations have been particularly active at Sackville, N.S., where important extensions to manufacturing plants and the general growth of the town are an evidence of its progressiveness and rising importance At Woodstock, N.B., steady progress was made during 1909. The new Broadway public school was built at a cost of some $30,000, the new court house completed and a report submitted by the council on the question of permanent improvements which are to be considered this season. Progressiveness is the keynote to the situation at Sussex, N.B., whose mayor, Mr. MacLean, writes, "We are advance agents of optimism. No calamity howlers are wanted here."

Charlottetown, P.E.I. — The volume of business done during 1909 was fully up to the previous year. Among the building operations were many improvements to the railway system, these including a new freight yard and conveniences and equipment of railway works.

St. George, N.B. — A building boom is looked for this year. Last season one or two inquiries were received from capitalists seeking location for manufacturing purposes and it is hoped that these will materialize during 1910.

An Active Year in Railroad Construction

Work of Last Season Promises Well for 1910—Enterprise of Leading Companies an Important Element in the Development of the Country

It is estimated that during 1909, 4,327 miles of line were constructed, placed under contract, or were in course of construction. In the previous year the new mileage totalled 514 miles. The present year also promises to be a good one for work on Canadian railways. Already the Grand Trunk Pacific has begun awarding contracts, the latest being for constructing 100 miles of single track west of Edmonton, Alta., to Prince Rupert. This is an extension of the main line and is only one of the several extensions and branch lines the Grand Trunk Pacific is planning for 1910. The Canadian Pacific Railway has also completed surveys for a number of branch lines, some of which at least will be put under construction this year. In Alberta there are two independent lines, which are worthy of attention, inasmuch as it is more than probable that they will begin active construction work this year. One of these is the Alberta & Great Waterways Railway, which projects a 350-mile line from Edmonton, Alta., to Fort McMurray. It is said on good authority that contracts for 150 miles of this line are to be let in the near future. The other Alberta line is the Alberta Central Railway. Surveys for the first 70 miles have been completed and the construction contract for this section has already been awarded, although the name of the contractor has not been made public.

What the C. N. R. Accomplished

1909 was a busy year with the Canadian Northern. This company completed 482 miles in five provinces and graded 398 miles ready for steel the coming spring.

Eastern Canada—The year was notable in eastern Canada. The C.N.R. Sudbury-Port Arthur line was extended 30 miles beyond Sellwood, so as to give better access to the Gowganda silver land.

Ottawa was connected with the Canadian Northern Quebec line by 58 miles of railway to Hawkesbury, constructed under the charter of the Canadian Northern. being on the south side of the Ottawa river. This piece of land is, however, being operated by the Canadian Northern Quebec Railway, of which there were completed and put into operation the 78 mile cut-off from Garneau to Quebec.

There were also completed 11 miles from St. Jacques to Rawdon. The completion of 89 miles in Quebec is the largest addition made to the mileage of Quebec during the last ten years.

The year witnessed the commencement of the second Canadian Northern Ontario line out of Toronto, the 100 miles of the Toronto-Ottawa line being now in the contractor's hands. This line is to form part of the Canadian Northern connection between Montreal, Ottawa and Buffalo, and will, it is expected, be ready for operation early next fall.

Western Canada—The 305 miles of track that were laid in the prairie provinces are distributed over seven branches, and grading has been finished on seven others, the most notable of which are the lines (1) from Prince Albert to Shellbrook, to be extended later to North Battleford and to Crooked Lake, 100 miles northwest of Prince Albert; (2) the branch from North Battleford to Jackfish lake and Turtle river, north of the Saskatchewan; and the line from Vegreville southward, which will this year reach Calgary, joining the Saskatoon-Calgary line about 80 miles northwest of the city.

Twenty-two miles of grading on the Edmonton to Athabasca Landing line were completed in 1909. In south-eastern Saskatchewan 90 miles of steel were laid westerly from Maryfield, near the Manitoba boundary, and 75 additional miles have been graded, making 165 miles of the line which is to be extended to Lethbridge.

In Manitoba the Rossburn branch has been carried from near Russel for 50 miles, whence it will be carried to the main line near Buchanan. Seventy miles have already been completed from Hallboro, and through Rapid City to the Satkatchewan boundary. The St. Rose du Lac district, south-east of Lake Dauphin, now has a 15-mile branch, and in southern Manitoba ten miles have been graded in the Turtle Mountain district. Between Lake Manitoba and Lake Winnipeg, the Oak Point branch has 36 miles ready for steel.

The construction programme for 1910 has not been completed. The line from Saskatoon to Calgary will, no doubt, be finished, and also the Vegreville to Calgary line, which will be joined at Camrose with the extension from Edmonton. The guarantees of the Saskatchewan and Calgary Governments, voted last winter provide for several hundred miles in addition to those already undertaken.

Western Canada Generally

The statistics for 1909 with reference to new steel laid in the West by the railway companies is as follows:

Canadian Pacific—		
Mileage at the beginning of 1909	5,693	
New steel in 1909	404	
Mileage at the beginning of 1910		6,097
Canadian Northern—		
Mileage at the beginning of 1909	3,250	
New steel laid in 1909	250	
Mileage at the beginning of 1910		3,500
Grand Trunk Pacific—		
Mileage at the beginning of 1909	982	
New steel laid in 1909	403	
Mileage at the beginning of 1910		1,385
Great Northern—		
Mileage at the beginning of 1910	490	
Total mileage in the provinces at the beginning of 1909	10,415	
Total new steel laid in 1909	1,057	
Total mileage in the provinces at the beginning of 1910		11,472

The railways of western Canada added 10 per cent. to their total mileage in 1909. Compared with the growth of population or the increase in the area under crop in the western provinces, this increase is of a satisfactory character.

Fully as large an addition to the mileage will be made during the current year, all the building companies having extensive building plans under consideration. The amount of survey and engineering work was never greater than in 1909. Lines have been run in many districts in all the provinces. Surveys have been made where railways will not be built in many years but at least a thousand miles of grading will be done in 1910 on the work done by the engineers in 1909.

G. T. P. Construction

During the year 1909 about 700 additional miles were placed under construction. During 1908, approximately 2,900 miles was under construction, comprising the continuous main line from Moncton, N.B., westerly to Edmonton, Alta. So that at this date there is partially completed and under way 3,600 miles.

Concerning Construction Equipment

The construction equipment used in executing any large civil engineering undertaking is subject to such extremely hard usage that it cannot be designed according to the usual rules for the determination of the size of parts of machinery. The tremendous shocks to which apparatus of this sort is often exposed, the lack of skilled attention paid to its wearing parts in most cases, its imperfect protection against dirt and rain, all combine to make its service a peculiarly onerous one, says the "Engineering Record." In addition, there is the fact that on any large piece of construction, experience has shown it to be advisable, in many cases, to work the equipment to the maximum, getting everything out of it that is possible and disregarding its possible scrap value at the end of the work. For example, anything that delays the operation of a steam shovel, not only holds back the work of the men in the pit, but may tie up a number of miles of track, keep a train or two standing idle, and leave a gang of men on a dump without anything to do. In the same way, drills that do not stand up to their work entail a loss to the contractor employing them which is far greater than the mere wages of the drill runners while the repairs are being made. The charges of blast holes which do not explode when fired are a source of danger as well as delay that has caused contractors a great deal of trouble.

These things are mentioned because it is not at all improbable that a good many manufacturers of construction equipment, who are desirous of turning out only the best apparatus, are not in touch with the service conditions of their machinery after it is delivered and do not really know what improvements should be made in it. A few companies have recently been making remarkable strides in a business way, in spite of the slack times in the construction field, because they have had inspectors visiting places where their equipment was in service and noting the troubles that have arisen in connection with it. These inspectors have indicated in many cases, it is understood, details of design where improvement of one sort or another could be made, and have thus enabled the manufacturers to better their machinery before complaints were made. Moreover, the good will of contractors has been gained by this evident desire of the manufacturers to do everything in their power to have the equipment they furnish give satisfaction. It is particularly desirable, where machinery of unusual size or character is sold, to have it watched carefully, and the failure to do this is likely to result in considerable adverse criticism, much of which is doubtless unwarranted because it is caused by lack of familiarity with the proper way of handling it, which nobody has been on hand to [illegible].

The resignation of Mr. McCullough, City Electrician of Vancouver, has been accepted, and the appointment offered to Mr. J. A. McCrossan, who held the post formerly. The salary is $1,800 per annum, with a prospective increase to $2,400.

Brick Production of the United States

The production of brick and tile in the United States for the year 1908 was 16 per cent. less than the production of 1907, but its value was $108,062,703, which is considered a very satisfactory figure. The decrease noted is attributed chiefly to the rapidity with which concrete is pushing to the front as a building material. Every State and Territory of the Union contributed to the totals, but Ohio led all the rest, with an output of products valued at $15,915,703 for the year.

Of all the clay manufactures for the year, the common brick leads in total value, the production reaching an estimated worth of $44,765,614, or 43.13 per cent of the total productions from clays. It required 7,811,046,000 of these common brick to foot up the total. For these brick the price at the kiln dropped from $6 a thousand in 1907 to $5.73 a thousand in 1908. Of the common brick, Illinois produced the largest number, her record being 1,119,224,000, which sold at the kiln at $4.32 a thousand.

Those two varieties of clay products which showed increases in 1908 were vitrified brick, for paving purposes, and the common drain tile of the country. The vitrified paving brick produced showed an increase of 101,877,000, with a decrease in value from $11.02 to $10.90 per thousand. At $9.86 per thousand, Ohio led in this production, with a value of $3,232,335, one-third of the product of the entire country. Drain tile increased in production almost 30 per cent., its value for the year being $8,661,476.

Building Walls of Mesh Reinforced Clay

Building walls of mesh-reinforced clay is advocated by W. Paetz, of Hamburg, Germany. He has worked out a complete practical system of construction on this basis The reinforcement comprises inner and outer sheets of wire fabric, and horizontal bedding sheets whose vertical spacing should not exceed the thickness of the wall. The preferred arrangement is to use sheets wide enough to form the two bedding sheets and also the outer faces of such a block of wall, and bend them into a hollow rectangle. In case of walls for heavy loads, a layer of cement mortar is placed between successive courses of wall. Window openings, etc., are framed in cement mortar, placed so as to dovetail with the courses of clay work. Wall plates, floors, roof framing and partition framing are of timber studding, but partitions are preferably filled with clay tamped between sheets of metal fabric nailed on each side of the studding. The exterior wall surfaces are covered with a coating of neat cement mortar as soon as finished, and the outside of this coating may be further plastered or dressed as desired. The inside wall surfaces are not plastered until after the walls have dried out fairly well; they are coated with plaster on neat cement mortar. The clay to be used in the wall construction should be used fairly dry, i.e., just moist enough to be capable of being tamped into a solid mass. It is said that it will usually be necessary to stack freshly excavated clay for a few days, under cover, to let it drain and dry out sufficiently. The government last year built a two-family dwelling of the system near [illegible], and after its completion a stable of the same construction was built on the premises. The total cost of both buildings is given as [illegible].

At Montreal, Que., during 1909 the [illegible] estimated loss by fire was [illegible].

Canada will have Long Period of Prosperity

Undeveloped Natura' Resources and Plenty of Capital Obtainable for Development Purposes Primary Factors Making for Progress

Forecast of Mr. George Paish, Editor of the London Statist

I have visited both western and eastern Canada and am persuaded that the country has entered upon a long period of prosperity. From time to time there will doubtless be pauses in the prosperity, but these will always occur in states which make rapid progress and such pauses are necessary to prevent inflation. But there is not likely to be even a check to the expansion for several years.

The primary factor making for progress is the possession by Canada of great undeveloped resources of natural wealth—agricultural, mineral, forestral and piscatorial. The greatest of these natural resources is the vast tracts of undeveloped and virgin lands that are merely waiting for farmers to produce a supply of foodstuffs sufficient to support a great population.

The second factor making for growth is the willingness of Great Britain to find all the capital that Canada can profitably employ, and to supply it at a low rate of interest in comparison with the rates of interest usually required from young countries. Every man of business is aware of the advantage to a country of a banker in a position to supply capital freely for development purposes and the special advantage of possessing a banker who will supply capital in practically unlimited quantities at a lower rate of interest than he charges in other countries. This is the situation to-day: British investors are supplying capital freely for permanent investment in Canada at preferential rates of interest. Hence no difficulty is likely to arise in securing the capital required to develop and to market Canada's natural wealth.

A third factor of great import is the ability and far-sightedness of Canada's statesmen. They recognize that the essential thing to be worked for is to open up the country and to admit population to the natural wealth. All the energies of the statesmen of the entire country, Dominion and provincial, are at the moment directed to the extension of railways. This is the platform upon which the ministries have been returned to office, and it is this policy they are pledged to carry out. Everything possible is being done to encourage and to stimulate railway construction both in prairie districts and between the prairies and the seacoast, east, west and north.

A fourth factor of great moment and weight is the world's special need of new sources of food supplies at the present time and the high prices that are now current for food of all descriptions. This condition of affais is mainly the result of the great expenditures of capital from the South African and the Russo-Japanese wars, an expenditure which prevented for about seven years the normal rate of capital outlay for the purpose of developing the food supplies of the new countries. Inasmuch as Canada is one of the most promising fields of food production, the shortage in the world's food supplies and the high prices of foodstuffs are having and must continue to have a great influence in stimulating the rapid settlement of the new agricultural districts.

A fifth factor exceptionally favorable to Canada is the extent to which the resources of the United States are developed. Canada's slow progress in the past has mainly resulted from the existence of the Great Lakes and a stretch of country of several miles in extent, consisting mainly of rock and water, which effectually cut off the farming districts of eastern Canada from those of the western States. As agricultural development proceeded west, this geographical obstacle forced the pioneer farmers of Canada into the United States. When railway extensions and railway economies made it possible and profitable to raise agricultural produce in Illinois and in the western States, the pioneer farmers of Canada sold their holdings in their own country and moved into the new districts of the United States. Further, when the Dakotas were opened up to cultivation large numbers of Canadian farmers sold their developed properties at good prices to take up virgin lands. Had topographical conditions in Canada been similar to those of the United States, these farmers would have remained in their own country and would have proceeded west as railway science advanced and it became possible to raise foodstuffs for export at an increasing distance from the seaboard. Illinois, Iowa and the Dakotas are now highly cultivated and farmers desiring land at low prices have to go still further west. In these circumstances large numbers of the old Canadian farmers who moved west from eastern Canada into the United States are returning to Canada to dwell in Manitoba, Saskatchewan and Alberta. Furthermore, considerable numbers of American farmers are also coming into western Canada. These pioneer farmers are a great acquisition to the new country. In the first place, they have skill and experience in breaking up the land, and in making it fruitful; and secondly, having sold at good prices the lands they had previously made productive, they have secured large profits and they are bringing a large amount of capital, consisting of farming machinery, cattle, furniture and cash into the new country.

Another factor of no small moment making for rapid development is the fact that the world's unappropriated lands are fast becoming exhausted and that Canada is one of the few countries which can still make gratis grants of fertile land to anyone who will carry out the simple conditions attached to the grant.

Lastly, the time is favorable for Canada to obtain the large numbers of workmen needed for railway construction, for extensive building operations, for distribution and for industries.

In brief, every essential to progress is apparently at the service of Canada—natural wealth, a practically unlimited amount of capital at low rates of interest, free markets and good prices for produce, a good supply of skilled farmers and of unskilled labor, together with statesmen exerting all their influence and power to attract capital and labor and to develop the natural resources of the country.

One of the great influences which prevented the development of Canada in the past has long ceased to operate. The long winters, the coldness and the liability to frost even during summer months have entirely lost their terrors. Experience has shown that the large number of hours of sunshine pressed into a few months more than make up for the shortness of the season, and that there is ample time to sow and to harvest the crops. Further, liability to damage from frost and drought is diminishing as cultivation extends. The recognition that the drawbacks to farming in western Canada have been greatly exaggerated is likely to cause the number of incoming farmers to grow steadily greater from year to year. In brief, from whatever point of view the outlook is regarded, the future of Canada appears to be assured.

Reservoir and Filtration Costs and Methods

In the annual report of the Chief of Army Engineers, United States Army for 1909, an appendix by Major Jay J. Morrow on the Washington, D.C. aqueduct and filtration plans possesses some value for engineers.

The Dalecarlia Reservoir was dredged and the cost per cubic yard is stated to have been $0.118, for a total of 110,590 cubic yards. Reference is made in several places to the purchase of a dredge, but it is not stated in the report whether the cost of the dredge is included in the price of 11.8 cents. The original estimate was that 134,000 cubic yards required to be removed, but a great many loose rocks were found scattered through the silt, and this prevented the removal of the material to as great a depth as was expected when the estimate was made.

In July, 1907, work was commenced on the riprapping of the slopes of the Dalecarlia reservoir, and it was completed in November, 1908. The total cost was $18,000. A quarry was opened on Government land near the southeast end of the reservoir, and all work was done by hired labor. The width of the paved slope is 18 feet, and the length 11,116 feet, making a total of 22,232 square yards. The rock quarried and placed on the slope amounted to 6,040 cubic yards. It is a matter for regret that unit costs were not given. The cost of quarrying and laying was $3 per cubic yard, and the thickness (from the figures given) must have been about 10 inches. Gillette's "Hand Book of Cost Data," page 242, gives the cost of slope walls as low as $1.75 to $2 per cubic yard in place for good "second class" work, 16 inches thick, to as high as $4.50 for a 6-inch sand papered job. Much depends on the cost of the stone delivered at the job.

The old masonry walls of a part of the reservoir were strengthened by means of concrete buttresses and wing walls. Leaks under the walls were cut off, by a concrete pavement in the well laid to or about the level of the sills of the entrances to reservoir, by-conduit and main conduit, after removing all deposits from the bottom of the well. A wooden sheet pile cofferdam, divided in sections small enough to permit of seepage to be removed by two diaphragm pumps, was constructed. The foundations were all carried down through the mud and loose rocks to a solid material consisting of a partially disintegrated soft rock similar to the Potomac gneiss, but not completely metamorphosed. This material was quite firm, when undisturbed, although it could be readily excavated by pick and shovel.

The amount of work done at the [illegible] and its cost are as follows:

	Labor	Material
Excavation, 700 cubic yards	$1,008.80	
Form lumber in cofferdam, 6,884 feet, B. M.	109.52	$138.91
Concrete in walls and paving 300 cubic yards	443.82	516.88
Back filling, 400 cubic yards	200.00	
Totals ..	$1,762.11	$655.79
Grand Total .		$2,417.90

The unit costs are as follows: Excavation, mud and rock, $1.44 per cubic yard; forming steel, $16 per M.B.M. for labor and $20 per M.B.M. for material; concrete cost, $1.47 per cubic yard for labor and $1.72 per cubic yard for material, the total for concrete being $3.19 per cubic yard, the cost of cement, sand and stone and rate of wages omitted. Cost of supervision and superintendence not stated, nor rent, cost, depreciation or wear and tear on machinery and tools. Backfilling was 50 cents per cubic yard for labor.

It cost $3.66 per million gallons for the operation of the District of Columbia filtration plant, the average amount being 61.47 million gallons per day. Sometime during the 90's Major T. W. Symonds' estimate was $2.62 per million gallons, based on 40 million gallons per day, neglecting depreciation and interest on cost of plant. This estimate was made before the plant was constructed, but the difference in actual cost of operation and the estimate, especially with 50 per cent. greater output, is remarkable. A table shows the total costs for labor and materials to be as follows per million gallons: 1905-6, $2.14; 1906-7, $3.07; 1907-8, $3.13, 1908-9, $3.66, a steady increase. Office and laboratory labor costs have risen from 45 cents in 1905-6 to 72 cents in 1908-9, and cost of materials used in office and laboratory from 4 cents to 10 cents. Pumping station labor costs have risen from 45 cents in 1905-6 to 61 cents in 1908-9, while costs of material connected with pumping station have risen from 59 cents in 1905-6 to 69 cents in 1908-9. Labor in filtering operations has risen from 49 cents in 1905-6 to 75 cents in 1908-9, and material costs in the filtering operations were 2 cents in 1905-6 28 cents in 1906-7, 11 cents in 1907-8, and 23 cents in 1908-9. Care of grounds, etc., has risen from a labor cost in 1906-7 of 7 cents to 22 cents in 1908-9, with material costs of 2 cents in 1906-7 and 18 cents in 1908-9. Main office expenses for the four years were respectively 9 cents, 4 cents, 9 cents and 13 cents, with no expense for materials the two first years, the costs being 1 cent for 1907-8 and 2 cents for 1908-9.

The costs given are costs per million gallons. In 1905-6 the average amount of water filtered per day was 66.07 million gallons, while the average for 1907-8 was 64.91 million gallons. The population of the city has increased and the decrease shown in amount of water filtered may be ascribed to reduction in waste of water. This has been due to a system developed of careful inspection and installation of meters. The average per capita consumption in 1907 was 203 gallons; in 1908, 192 gallons, and in 1909, 179 gallons. The average consumption of all water, filtered and unfiltered, has been reduced from 66.9 million gallons per day in 1907 to 61.47 million gallons in 1909. It looks as if some system of careful inspection of labor wastes would pay. The leaks seem to be in the main office, park labor on grounds and filtering operations. The increased pumping costs are readily explained by another table showing that the coal used in 1905-6 cost $3.34 per ton and had a duty of 62.8 per 100 pounds of coal consumed, the coal used in 1908-9 costing $3.47 per ton with a duty of 57.7 per 100 pounds of coal consumed. This means a slight increase in cost of material and a lower percentage [illegible] in labor.

Experiments made to determine rates of filtration were made with rates varying from one to one hundred million gallons per acre per day. Results seem to indicate a rate somewhere near 40 million gallons per acre per day, above which the filters cannot be operated economically and can not be depended upon to furnish a satisfactory effluent at all times. With higher rates there is also danger of [illegible] or disintegration of filtering material. High rates are not quite so effluent was lower rates on bacterial and turbidity ratings, but there is practically no difference in the percentage of samples showing bacillus coli.

During the fiscal year ended July, 1909, the bacteria have been reduced from an average of 389 per cubic centimeter in the park reservoir to an average of 21 in the filtered water reservoir. The average turbidity has been similarly reduced from 22 to 1 part per million. The actual number of barteria in the city water varied from 160 to 2 per cubic centimeter, while the number in the river water ran from 90,000 to 38. The actual average reduction by months varied between 99.7 and 97 per cent. The report, known as Appendix D D D, contains a number of tables interesting to men making a study of water filtration and consumption.

Report on Hudson's Bay Railway

The report of the engineers who surveyed the alternative routes of the proposed Hudson's Bay Railroad, has been laid before Parliament. The investigation of the engineers leads them to conclusions strongly in favor of the Port Nelson route as compared with the Fort Churchill. To connect Churchill with the Pas, the nearest railroad point at present to Hudson's Bay, would require the construction of 477 miles of line, while only 410 would have to be built to connect the Pas with Nelson. The Nelson route lies through better country, more adaptable to settlement, and the line could be built with better grades and more cheaply to the mile.

The total cost for a line with eighty-pound rails, stations, engine houses, water tanks, yards, two 4,000,000-bushel elevators, and harbor improvements, exclusive of lighthouses and buoying, is estimated at $19,108,672 to Fort Churchill, and $16,426,340 to Nelson, a difference of $2,682,332 in favor of the Nelson route. Nelson harbor is described as more commodious and more easily approached than Fort Churchill, and could be more economically equipped, the cost of developing facilities at Fort Churchill being estimated at $6,750,000, and for Nelson the estimate is a little over $5,000,000. On the Churchill route a line was found with four-tenths of one per cent. grade against northbound, and six-tenths of one per cent. against southbound traffic. On the Nelson route a line was located with a maximum of four-tenths of one per cent., or practically level both ways. The examination of Nelson harbor was not thorough, but a channel with a depth of 26 feet at all tides was located The harbor proper would be from ten to twelve miles inside the mouth of this channel.

The annual meeting of the Toronto branch of the Canadian Society of Civil Engineers was held last week, when the following officers were elected for 1910: Chairman, Mr. A. W. Campbell, Deputy Minister of Public Works, Ontario; Secretary-Treasurer, Mr. Peter Gillespie, lecturer in applied mechanics, Toronto University. Councillors: Mr. T. S. Scott, assistant city engineer; Mr. T. C. Irving, Jr.; Mr. O. W. Smith, Mr. N. H. McLeod, and Mr. A. W. Connor. Mr. Cecil B. Smith presided at the meeting. Prior to the meeting an enjoyable dinner was held in the St. Charles restaurant.

Upon his recent visit to Toronto, Sir Wilfrid Laurier was waited upon by a deputation of architects, the object being to urge the adoption by the Government of the plans recommended by the Ontario Association, for the addition to the Government buildings at Ottawa. Nothing definite was stated by Sir Wilfrid.

Trade News from Montreal

Favorable Weather and Bright Prospects Enliven Usual Winter Dulness — Items of General Interest

Montreal Office of the "Contract Record."
January 10th, 1910.

The opening days of the new year brought to Montreal its first taste of real winter weather, the thermometer registering in the neighborhood of 20 degrees below zero. Up to that time the moderately mild weather and light snowfalls had made the work of contractors engaged on exterior construction comparatively easy. Fortunately the cold snap did not continue and once again moderate weather conditions prevail. On the whole this district has been favored with exceptional weather for winter operations.

To say that building prospects for 1910 are bright is putting it mildly. Every day more is learned concerning projects which the different large corporations have under consideration for construction during the present season. The latest reports reveal the fact that the different railway companies will be extensively connected with construction operations, and will erect office buildings, railway stations, construct tunnels, etc. This year will probably see the entrance of the Canadian Northern Railway, and it should prove an important factor in the building world in Montreal.

Around St. James street, if the present plans of the various companies are carried out, should centre a scene of activity, and when one considers the number of old fashioned one and two-storey structures on this important thoroughfare, this is not to be wondered at. In time this section of the city will be built up with magnificent office buildings, and from the present outlook a number will be erected this season.

New Subway for Park Avenue

If the Railway Commission pass favorably upon the plans submitted by the council of the town of St. Louis just before its annexation to Montreal, the new ward of the city will have its third subway.

A few years ago work was completed on a tunnel on St. Denis street, the first for that section of the city. Contractor Duquette is now working on the new St. Lawrence subway, and the present plans are for another similar one on Park avenue. It is expected that this work will be carried through at the expense of the city of Montreal.

Montreal's Ice Palace

The Parks and Ferries Committee of the city council granted the Montreal Carnival Committee permission to erect an ice palace on Fletcher's Field between Rachel and Mary Ann streets, and the work of constructing it has been commenced by the contractors, Messrs. Corriveau & Brunett.

Designs for this structure were invited by the committee and tenders were taken. Those submitted by Architect Theo. Daoust were finally adopted, as the tender by Messrs. Corriveau & Brunett upon his plans was the most satisfactory. The estimated cost of the ice palace is $6,300.

New Cars for the Grand Trunk Pacific

The management of the Grand Trunk Pacific Railway Company recently placed an order with the Canada Car Company, of Montreal, for 700 box, 200 refrigerator, 200 stock, and 300 flat cars. This company delivered to the Grand Trunk Pacific Company between October 1st and November 30th, 512 box and 45 stock cars, while in the same period the Pressed Steel Car Company delivered 23 steel coal and 4 buffet cars from their Point St. Charles works.

Western Order for Montreal

The order for steel rails and other supplies required for the construction of the Alberta & Great Waterways Railway, which is being built between Edmonton and Fort McMurray, is being placed in Montreal.

New Construction Company

The St. James Construction Company was recently incorporated under Dominion charter with a capital of $125,000, to carry on the business of general contractors and builders. The following Montreal men are connected with the new enterprise: Messrs. C. A. Duclos, K.C.; W. L. Bond, J. J. Meager and J. E. Conlen.

Personal Mention

Contractor Lalonde this week commenced the erection of the public bath at the corner of St. Dominiqu and Maguire streets.

Mr. G. J. Bury, general manager of the western lines of the Canadian Pacific Railway, was in Montreal on a business visit during the past week.

Mr. M. A. Fuller, of the Canadian Rand Company, Limited, has been transferred from Montreal to the Sherbrooke, Que., offices of the company.

Mr C. H. Cahan, K.C., president of the Canada Cement Company, Limited, has once more resumed his duties after an extended absence due to illness.

Messrs. F. F. Cavanagh and C. E. Booth recently opened offices in the Coristine Building, and will carry on the business of civil engineers and mining brokers

Mr. M. J. Butler, Deputy Minister of Railways and Canals, was in Montreal recently and attended the meeting of the Intercolonial Railway Board of Management.

Mr. F. W. Peters, Winnipeg assistant to the second vice-president of the C.P.R., who was in Montreal recently, speaks in glowing terms of the general western outlook for 1910.

Mr. W. S. Painter, architect for the Canadian Pacific Railway, left on Saturday, Jan. 8th, for a business trip to the West, and will be absent two weeks. Amongst other things, the contract for the erection of additions to the Empress Hotel at Victoria will be settled during this trip.

Mr. H. P. Beck, general superintendent of construction for Messrs. D. G. Loomis & Sons, on the new Jacobs' Buildings, Montreal, was recently presented with a handsome dressing case by the workmen employed on this construction. Mr. W. L. Caniff, the general foreman, was at the same time presented with a gold watch.

The annual meeting of the Canadian Society of Civil Engineers will be held in the Dorchester street rooms on Jan. 25, 26 and 27. The prospects are exceedingly bright for a full gathering of the society's members from all over Canada, and considerable interest is being manifested in the election of officers for the ensuing year, which will be carried through during the session.

Mr. H. S. Holt, president of the Montreal Light, Heat & Power Company; Mr. F. W. Thompson, managing director of the Ogilvie Flour Mills Company, and Mr. Thomas J. Drummond, president of the Lake Superior Corporation, of Montreal, are interested in the formation of the Superior Rolling Mills Company, who will erect a $300,000 wire and nail factory at Fort William, Ont.

From the Federal Capital

Correspondence of the Contract Record

Ottawa, Ont., Jan. 10, 1910.—The holiday season and the winter have not very materially affected building operations here up to date. While there are not so many residences in course of erection at the present time as in the summer, yet it is astonishing how building operations in this respect have continued. With regard to the large contracts being carried on, there is no apparent cessation. The Chateau Laurier, the Central Station and annex, the Carling Building, and other large buildings are going on apace.

In speaking to manufacturers of the various building materials, we are told that the demand is almost equal to that of summer, with the exception of concrete material. The changes in building material, if any, are very slight. Pressed bricks are quoted at $18 and $20 for red and buff; plastic and rustic at $10.50 and $16.50 respectively. Common bricks are worth $7, $9, and $12 for soft, arch and face; crushed stone, $1.25, double screened, $1.75, and 2-inch $1.25; lime, 33 cents and 35 cents per cwt. There appear to be no recent changes in prices of lumber, although it is just possible that a rise may take place in hardwood flooring, consequent upon the stiffening prices for the hardwoods.

Ottawa has had a banner year in building operations, the total value reaching the $4,000,000 mark. From indications which may be regarded with some confidence it is anticipated that 1910 will at least be just as good.

The city is proceeding to complete the police substation and the fire station, which is part of the new grand stand erected last summer. The work is being done by day labor, under the superintendence of the architect, Mr. W. E. Noffke.

The Ottawa Builders' Exchange will hold their annual meeting on Thursday evening, the 27th inst. Agenda: Election of officers for ensuing year, receiving of annual reports, etc. During the past year they have been endeavoring to frame a "Uniform Contract Form." This is now in printed form, distributed among the members for their consideration. The annual banquet of the Exchange will take place early in February next.

The annual convention of the Canadian National Association of Builders will be held in London, Ont., on the 8th, 9th and 10th of February next. Matters of special interest to builders will be discussed. Several of the delegates will read papers upon building construction, materials, and other interesting subjects.

To prepare rusty ironwork for painting, it may be saturated repeatedly with benzine applied with a paint brush, and well scrubbed with a wire brush between the applications, finishing with benzine, which must be allowed to evaporate before the work receives two coats of genuine red lead mixed with boiled linseed oil. A little varnish added to the third coat of paint, which will be of the desired color, will make it durable and form a protection against weather.

The death occurred recently at St. Boniface, Man., of Mr. Michel Cyr, a retired building contractor who went to Winnipeg from Montreal in 1882, and built several of the best structures in the city. The late Mr. Cyr was a personal friend of Sir Wilfrid Laurier. He was eighty years of age.

Remodelling an Old System of Heating

Description of Unique and Interesting Work—Present Day Requirements compared with those of Former Times—Utilizing Old Material

By Thomas Barwick.

It is the intention of the writer in this article to illustrate what can be done, with economy, in the remodelling of an old system of heating, utilizing old material, although it may have been in use for many years. The article will also serve to illustrate the difference between the present requirements in heating and these of thirty or forty years ago. The plant changed over was originally placed in the building about forty years ago, and was of a fair size at that time, but the lower pressure used at the present time called for an additional amount of surface and a more economical use of fuel.

In most of the rooms the old apparatus would provide 70 degrees in zero weather, when the plant was operated at 25 to 40 pounds pressure, but many of the rooms were too cold, owing to exposure. The building stands alone on an elevation where the winds sweep around it, and these conditions had to be considered. The section done at this time was the north end, and was supplied by a 4-foot by 16-foot harizontal tubular boiler. This old boiler was in use up to the time of changing, and the plant owed but little to the owners, as far as its life can be considered, it being unusual to expect a plant's depreciation to be less than 5 per cent. However, this plant was in use, with a depreciation of only about 2½ per cent., and as the repairs made were done in a very meagre manner, there could not be much hope for a longer life of the plant.

Some 18 years ago an addition was made to the building, which was considered on a much broader plan, as far as the heating requirements were concerned, and this portion of the plant was in excellent condition at the time of the change and of ample proportion, so that it was used with but slight addition and but one or two changes, and can be safely expected to last for another decade. At the time of making the addition a second boiler was installed, which was 5 feet by 16 feet.

The old plant was a gravity system, but owing to the varying pressures used for domestic service, the plant was operated with the condensation discharging into the sewer. This meant a waste of fuel. The cramped position of the boilers left them in such a way that they could not be re-tubed on account of the small space in which they had been placed. It was decided to build a new boiler house and use the old 5-foot by 16-foot boiler, which was found in fair condition, with the exception of two tubes, which required renewing. Another consideration was the noise and dust transmitted through the building, and the problem came as to the best situation without expense. The chimney was located in the courtyard, and for economy could be used in connection with the new boiler house. A new boiler house was therefore erected beside the stack.

The new boiler house was located at a grade considerably above the sub-basement level, therefore the pumps were placed in the sub-basement, and while not as convenient as if placed in the boiler room, they have been found very handy in operation. In changing over the plant it was necessary to keep the apparatus in the building in operation at all times, and therefore a short description of what was done will serve to guide others in similar cases. The old 4-foot boiler on inspection showed that all of the tubes were in pretty good order, but the shell was burned on the underside in some places. It was set with a brick course over the top of the shell above the lugs. A couple of bricks were dislodged, which showed that the shell was badly rusted out. It was therefore ordered discarded. The 5-foot boiler, placed at a later date, was found to be in fair condition, with the exception of a slight leak in two tubes at the rear, which did not appear to be so bad that it could not be used, as the extreme cold weather was not expected before a new boiler could be placed in the boiler house. As the "unexpected" sometimes happens, we did not remove the old 4-foot boiler at once, although we disconnected it, and the "unexpected" did happen at a most inopportune time. We had a bad leak which could not be stopped readily in the blow-off connection of the 5-foot boiler, and therefore we made a hurried connection to the old 4-foot boiler to tide over the situation, trusting to good fortune for the short period. After repairs, a short period of very cold weather came upon us, and we used the old 4-foot boiler at a very low pressure to take care of part of the heating, making temporary connections. Some of the features of the plant are not new, but novel in the arrangement, as described further on.

In remodelling the plant some consideration had to be used, owing to the small amount of money available; therefore, while it is not always wise to utilize old-fashioned appliances, if they will perform the work as economically as new it is advisable to use them. In the repiping it was found that a number of the old rising lines were in very good condition, and as the pipe was of the best grade of old-fashioned wrought iron pipe which we tested and inspected, we allowed it to be used over again for return pipes, and as it is a hard matter to detect present steel pipe from iron, the writer preferred it to the new, for such use. The piping work in the older section of the building was enlarged and subdivided so that sections could be repaired without closing down all parts of the apparatus, and also for the reason that part of the old and part of the new had to be in continuous use.

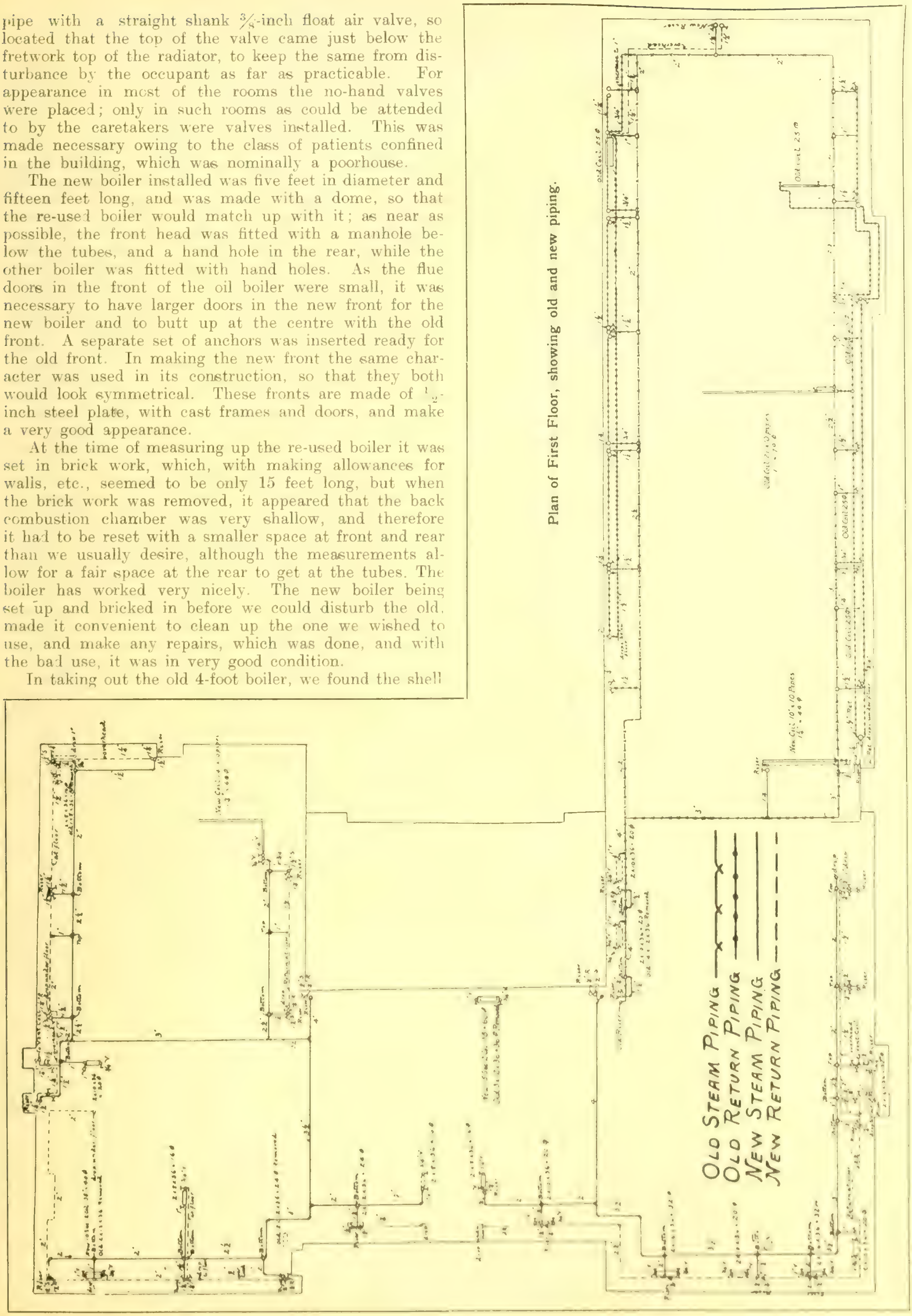
In the new arrangement the condensation was to be returned to a receiving basin and then pumped into the boilers. Provision had also to be made for installing a future lighting plant. The radiators in the building were of the old pattern, with the ¾-inch supply connection and 1¼-inch return connections, and therefore could be used by a slight rearrangement of bushing down the return, with eccentric bushings, and by enlarging the tappings of the supply. The return ends of the radiators were originally fitted with air-valves in one of the last pipes, but in many cases these valves had been discarded and plugged up, or miscellaneous styles of cocks and valves used. In some cases the pipes were cut off and short pipes without cocks used.

The rearrangements of the radiators were all marked on the plans, showing where they could be taken from and replaced in new position where new and larger radiators were desired. The radiators were rearranged for air valves by taking out the old air pipes and placing a new pipe with a straight shank ¾-inch float air valve, so located that the top of the valve came just below the fretwork top of the radiator, to keep the same from disturbance by the occupant as far as practicable. For appearance in most of the rooms the no-hand valves were placed; only in such rooms as could be attended to by the caretakers were valves installed. This was made necessary owing to the class of patients confined in the building, which was nominally a poorhouse.

The new boiler installed was five feet in diameter and fifteen feet long, and was made with a dome, so that the re-used boiler would match up with it; as near as possible, the front head was fitted with a manhole below the tubes, and a hand hole in the rear, while the other boiler was fitted with hand holes. As the flue doors in the front of the old boiler were small, it was necessary to have larger doors in the new front for the new boiler and to butt up at the centre with the old front. A separate set of anchors was inserted ready for the old front. In making the new front the same character was used in its construction, so that they both would look symmetrical. These fronts are made of ½-inch steel plate, with cast frames and doors, and make a very good appearance.

At the time of measuring up the re-used boiler it was set in brick work, which, with making allowances for walls, etc., seemed to be only 15 feet long, but when the brick work was removed, it appeared that the back combustion chamber was very shallow, and therefore it had to be reset with a smaller space at front and rear than we usually desire, although the measurements allow for a fair space at the rear to get at the tubes. The boiler has worked very nicely. The new boiler being set up and bricked in before we could disturb the old, made it convenient to clean up the one we wished to use, and make any repairs, which was done, and with the bad use, it was in very good condition.

In taking out the old 4-foot boiler, we found the shell

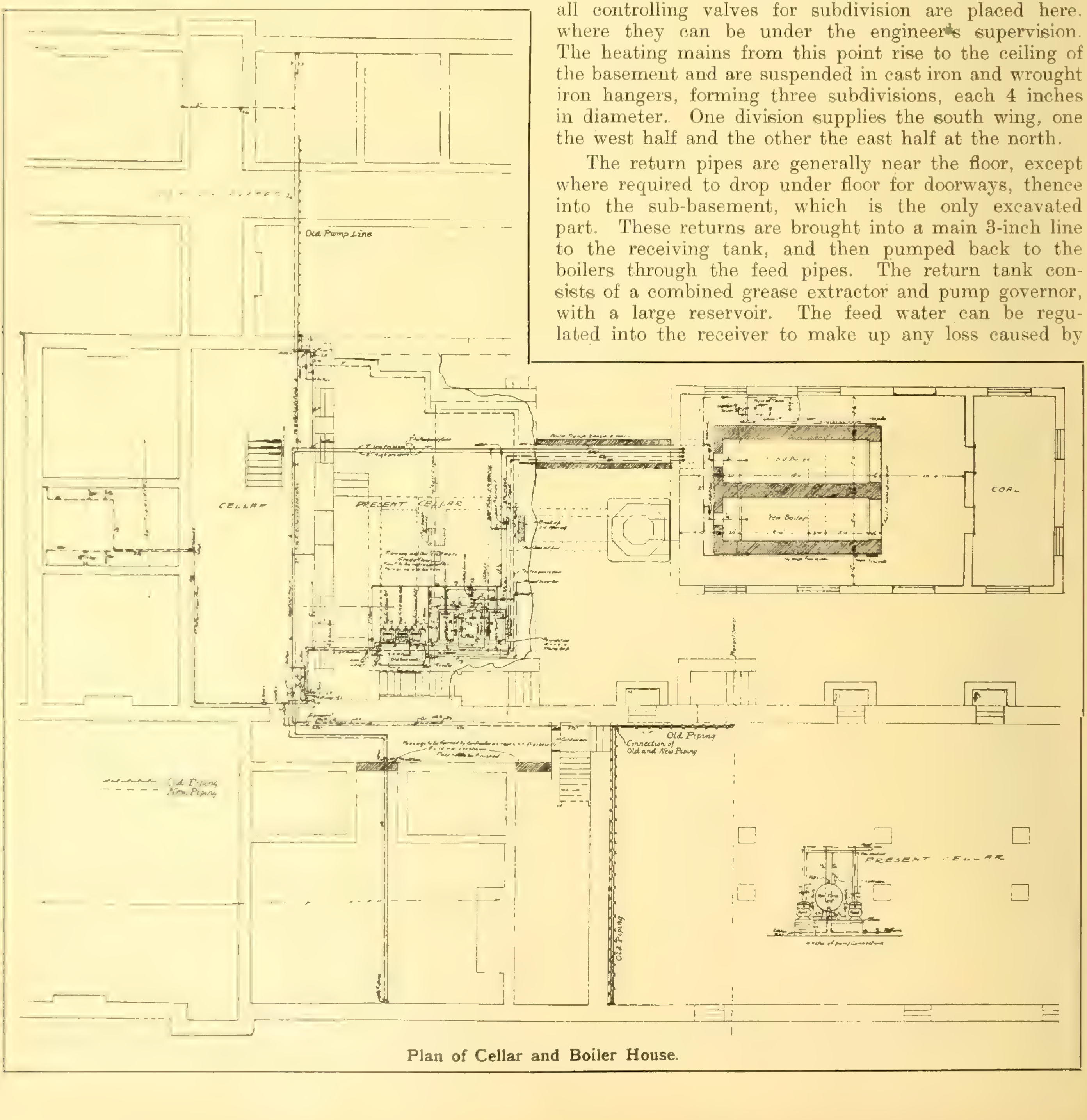

Plan of First Floor, showing old and new piping.

at the top, where the 4-inch course of brickwork had formed the covering in, had been eaten away by rust in such a way that flakes of large size could be pealed off, all over. Taking an ordinary hammer, and striking a sharp blow, the point went clear through and showed that the shell for a space of about a foot had rusted and flaked until it was less than one-eighth of an inch thick. In setting the new boiler and in resetting the one used over, a course of asbestos blocking was used, and the space between the wall and the shell at the safing in was packed with dry asbestos fibre, so that expansion would be provided for. In forming the bridge wall at the back of the grates, a long flat surface was formed instead of the usual level, giving a flat space 4 inches above the grate on the bridge wall to serve as a sheaf to push back the good coals, while the bottom clinker was removed.

The boilers, having a good length of tube, it was thought best to extend an iron flue from the front of the boilers, instead of extending a return flue above the shell, and this smoke pipe was made of ⅛-inch iron fitted with hand damper at each boiler, with a main damper for operation by the automatic regulator. The blow-off from the boilers was connected into a 3 x 6 foot blow-off tank, which was allowed to overflow into the sewer which runs beneath the grade at this point, a vapor pipe being extended up through the boiler house roof.

The steam connections are connected into a 10-inch manifold, and from this manifold the different steam mains extend into a trench and thence into the sub-basement of the building. One of these pipes supplies the return pumps and another pump placed some distance from the building for water supply. Another pipe connects into the kitchen and the main heating supply. The pipes are valved near the manifold, and the heating main is by-passed and fitted with a reducing valve to bring the boiler pressure down to two pounds or as required. As these pipes drop into the sub-basement they are drained at suitable points with one-inch relief piping into the separate traps for the system. The sub-basement is only under a portion of the building, and all controlling valves for subdivision are placed here, where they can be under the engineer's supervision. The heating mains from this point rise to the ceiling of the basement and are suspended in cast iron and wrought iron hangers, forming three subdivisions, each 4 inches in diameter. One division supplies the south wing, one the west half and the other the east half at the north.

The return pipes are generally near the floor, except where required to drop under floor for doorways, thence into the sub-basement, which is the only excavated part. These returns are brought into a main 3-inch line to the receiving tank, and then pumped back to the boilers through the feed pipes. The return tank consists of a combined grease extractor and pump governor, with a large reservoir. The feed water can be regulated into the receiver to make up any loss caused by



Plan of Cellar and Boiler House.

exhaust or waste The exhaust from the pumps is connected into the grease extractor section, and the steam is used in the heating system, a by-pass being formed with valves and back pressure valves to exhaust into the atmosphere. The exhaust pipe follows through the trench into boiler room, and above the boiler house roof into a condenser head.

The heating apparatus was used during last winter, with a circulation throughout the entire system of 1½ pounds' pressure and at a test with a 25-mile wind and zero weather. There were no rooms having a temperature below 70 degrees, many being above this point. In general the heat is turned on from the boiler room at about 6 o'clock and shut off at 10, and again turned on about 1 o'clock for a short period, and again about 5 o'clock. The fires are usually run banked, and are usually closed unless very cold at 9 o'clock at night. The cooking appliances were all re-connected with new pipe and valves, and all piping around these fixtures was raised above the floor, the main supply and return running under the floor. The return pipe was connected with a trap and the condensation discharged into the receiver. A hot water tank was provided with a coil and was connected to the high pressure steam line to the pumps, and the return from the coil was run to a trap, the water of condensation being discharged into the receiving tank The grease extractor was drained through a trap and discharged into the receiver. The grease waste and drips from pump cylinders and separate drain pipes from each system were discharged into a 2 x 5 foot drip tank, placed on the floor below the hot water tank. A steam siphon, provided in the drip tank, discharges the waste water into the sewer, which is about 8 feet above.

During the time that the general heating system is closed off it is desirable to have some rooms, used as sick rooms, heated, therefore the two risers at the centre of the north side were disconnected from the general heating and a separate heating pipe was run to supply these risers, as it would be likely to require these sick rooms at some time when heat was not on the heating main. A separate steam pipe from the pump line was run and fitted with a pressure regulating valve and stop valve, and the drip and returns were brought back separately to a trap, and the condensation discharged into the receiver. The pipes in the basement were left uncovered except in the storerooms, and they help to heat the rooms. All pipes in the boiler room and sub-basement are covered with 1-inch sectional asbestos covering canvas jacketed and banded. The tank and receiver are covered with 1½-inch asbestos plaster.

The above equipment was erected for about $7,500. which, considering the inconvenience of making temporary makeshifts, and loss of time, owing to the occupancy of the building, is fair and allowed a reasonable profit to the contractor.—"Engineering Review."

Mr. W. E. Vanstone, president of the Vanstone Heat & Plumbing Company, of New Westminster, B.C., died last week at Wawanesa, Man.

The Montreal branch of the Canadian Manufacturers' Association held a meeting last week to discuss the increases in the rates for workmen's accident liability in consequence of the going into force of the new Workmen's Compensation Act in the Province of Quebec. The increase will range all the way from forty to four hundred per cent. It is claimed there are many ambiguities in the act, and it is probable some step will be taken to approach the Government with a view to making some changes which are considered essential.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

1950. Steam and electric cranes, excavators, steam winches, windlasses, etc.—A London firm manuafcturing steam and electric cranes, excavators, steam winches, windlasses, etc., desires to open up business in Canada.

1952. Agency—The London agency of a French firm manufacturing cast iron pipes inquires for the names of Canadian firms open to take up their representation in the Dominion.

1991. Stoneware pipes, glazed sinks, etc.—A firm in the Midlands of England manufacturing stoneware pipes, glazed sinks, roof tiles, fire bricks and glazed bricks, desires to open up business with Canada.

1992. Agents—A Staffordshire firm manufacturing floor tiles, glazed tiles, roof tiles, blue bricks, terra cotta, mosaic, etc., and glazed faience, wishes to appoint Canadian agents.

1995. Heating and ventilating specialties—A London firm manufacturing heating and ventilating specialties is anxious to appoint an energetic and reliable firm in Canada as representatives.

Remuneration of the Architect

The American Institute of Architects is taking definite action approving the long-discussed plan to advance the minimum charge for their professional services from five to six per cent. The following official explanation for this action is given:

"While the remuneration of the architect has not advanced during the past 50 years, the cost of production, office expenses and draughtsmen's salaries have nearly doubled; proper equipment requires a longer preparation, a more thorough education; and the responsibility of the architect has been enormously increased by the requirements of the modern structure, with its engineering, mechanical and electrical equipment."

The argument, simplified, is that the architect's services are worth more than they were a score or two score years ago. It would seem that this is almost a self-evident proposition. This age is distinctively one of specialization, as has often been remarked. The lawyer, the doctor, and the trained specialist in every line commands a higher stipend for the particular service which he is able to perform. The claim cannot be made that the architect has not progressed in skill and peculiar attainment in the same degree as men in the other professions. His service is more valuable to his client and the cost of its performance is greater.

Mr. C. M. Canniff has been elected president of the Engineers' Club of Toronto.

Mr. H. M. Scott, of Hood & Scott, architects, Fort William, Ont., left last week for London, Eng., to spend the winter at his former home.

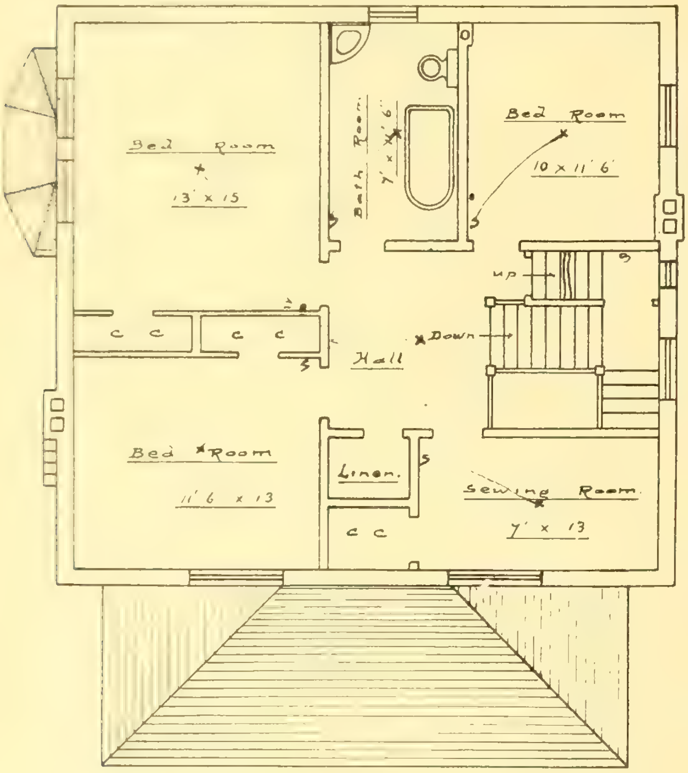
A meeting of the council of the Royal Architectural Institute of Canada will be held in the rooms of the Royal Institute, No. [illegible] Beaver Hall Square, Montreal, on Tuesday, 18th January, at 2.30 p.m., to consider the nomination of an assistant secretary, the opening of a ballot for the election of members, the consideration of applications for membership and the transaction of any other business that may arise. Mr. Alcide Chausse is honorary secrtary.

Estimating by a Reliable Uniform System

The Third of a Series of Practical Articles Designed to Illustrate the Advantages of Up-to-date Figuring—Lather and Plaster Work

Specially Contributed by W. M. Brown, C. E.

Lather Work In measuring lather work of this house we begin with the ceilings. First, describe the thickness and quality of lath, also the manner in which it is put on and nails used. Then take the inside measurement within the walls, the length by the breadth, and multiply the same by 3, then give the contents in superficial yards, and price. There are no deductions made at partitions, unless they are 9 inches thick or more. All openings to be deducted. Where there are any cuttings at angles, an allowance of 6 inches by the length is added to the quantity. In measuring the walls for lath, the inside length and breadth to be doubled, and then multiplied by the heights of ceilings, taking from the top of floor joist to bottom of joist of floor above in each case. All openings to be deducted. Where cuttings occur at angles an allowance of 6 inches to be charged, and multiplied by length. Circular lath work to be measured and charged separately. · Conical, elliptical, pyramidal, or any specialized class of work to be minutely described and charged separately.



Second Floor Plan.

Some Points in this System—According to some methods, where angles occur, in large dimensions, the extreme length is taken by the height, and calculated in full to make up for space wanting at angle. In this case, the quantity of lathing done would be charged 30 x 10 feet, the extreme size. But this would be too much to give as an equivalent for lath awanting and extra cutting at angle. According to new system, the net size is taken, which is the average of 30 feet and 20 feet by 10 feet, the height, and add length of cutting, 14 feet 2 inches by 6 inches, to quantity. . Where there is a double cutting, multiply the length by 1 foot.

Plaster Work—Give the number of coats and finish of plaster in connection with measurement. In measuring the plaster work begin with the apartments of second floor and proceed downwards. Measure each apartment separately, taking the ceiling length by breadth, and walls double of same by height. When all apartments on this floor are measured, take same in floor below, and then ceiling and walls of basement. Thereafter measure ceilings and walls of stairs, landings, entrance hall and vestibule. Where mitres occur on cornices, mouldings or enrichments, charge same at price for each. Where there are any arrises (sharp angles on plaster), or relieved beads (extra work on plaster relieving timber beads) or forming mouldings on plaster or cement, the same to be charged by lineal foot for extra labor. Deductions from plaster to be made at all openings, and any extra work at same to be charged separately. The measurement of all surface plaster to be net, and where circular work, to be charged separately, and described as such. Cornices, enrichments and mouldings to be described and charged separately. Centre pieces to be mentioned separately, stating diameter. Conical, elliptical, pyramidal or any specialized class of work to be minutely described, and charged separately.

Advantage of Accuracy in this System—It is a prevalent custom in this country in measuring plaster work to allow half of the opening only to be deducted, to make up for the extra labor entailed in working around the opening. This may be all very well for a small opening, but when it comes to a very large one, then the contractor gets a greater benefit than he is entitled to on this occasion. The most equable method is to deduct the opening net, and charge any extra labor entailed. All angular forms of plaster work to be measured net, and the beads and mouldings at same charged extra and described. It is strict attention to the formulated rules as to particulars regulating deductions, as well as extras, in connection with this system, that gives the most accurate and reliable results.

The Builders' Exchange at London, Ont., have secured excellent quarters over the Bank of Nova Scotia. The new quarters have been tastefully decorated and are well equipped for the requirements of the members. Prparations are being made to entertain the convention of the Canadian National Association of Builders on Feb. 8th. The annual meeting of this Exchange will be held on the 13th inst.

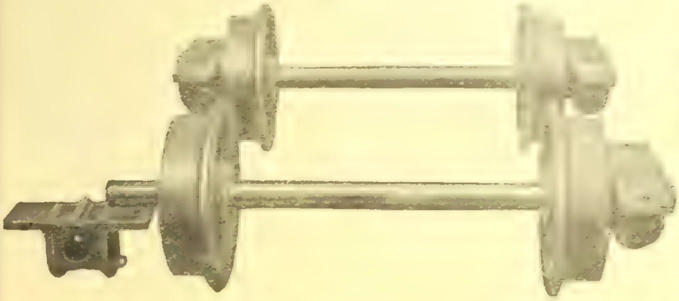
What is believed to be a record breaking piece of slate rock was removed recently from the Highland quarry, at Slatedale, Pa. It was pure, first class slate 18 feet long, 8½ feet wide and 5½ feet thick, and practically every inch was worked into marketable product, with no waste to speak of.

Car Trucks

for

Building Your Own Cars

We are prepared to supply **Full Sets** of **Car Irons** or **Car Trucks** to Contractors who desire to build the woodwork of their own cars.



Above is our standard set of 14" wheels for gravel or construction cars, with babbitted boxes. Also supplied with brass bearings and dumping irons if desired.

We can give you any size of chilled or unchilled wheel up to 24" and for any gauge track. We also manufacture Irons for Peteler style dump cars, and can make shipment on short notice.

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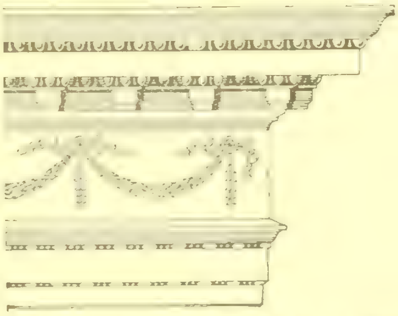

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They are made of sheet copper or galvanized steel and are absolutely [illegible]
"Metallic" cornices can be furnished in any design desired to suit your drawings and specifications.
Let us give you prices and full information--send us your specifications. Our catalogue of sheet metal building materials, No. 70, will interest you. Write for it.

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Manufacturers of

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YOU simply press a button, put the receiver to your ear and—there's your man **talking** to you.

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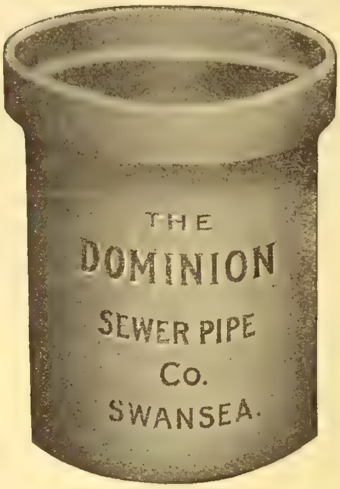

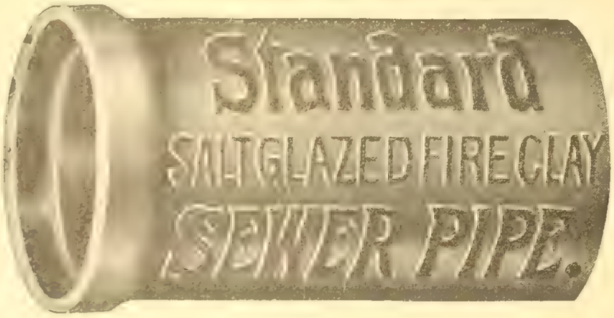

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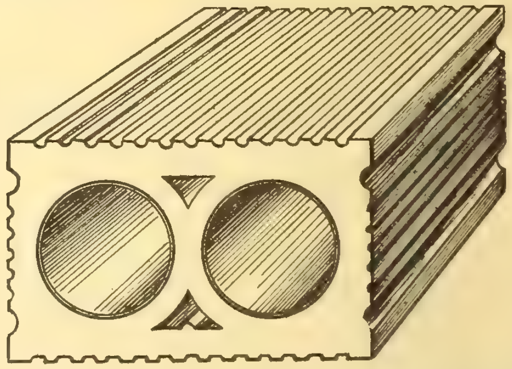

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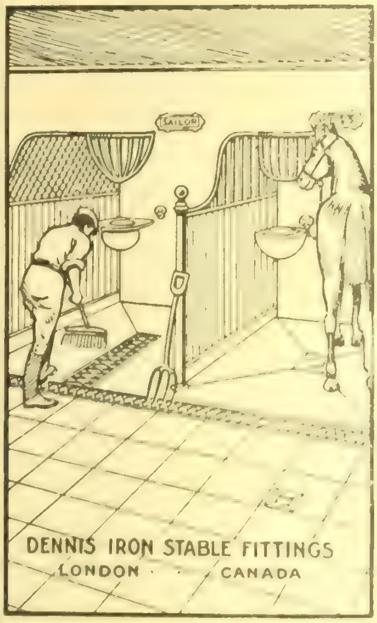

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Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, for foundation work	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b. with 30 and 5 per cent. off for wholesale:—

	Star	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7.25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, any color, ¾-in. square, 1-in. hex. and 3-16-in. round, 35 cents per square foot up.
Floor Tile—½-inch square, 45 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 35 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish, colors, firsts, 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G. cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Brass Goods, Valves, etc.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.
Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.
No. 4 compression bath cock........net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Furnaces, 45 per cent.; registers, 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.; other specials, 40 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00

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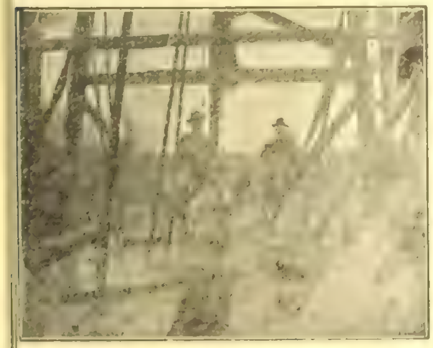

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Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 70; malleable bushings, 67½; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 67½ per cent.

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Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.

7 and 8-inch pipe, 40 per cent.

Light pipe, 60 per cent.; fittings, 70 per cent.

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Cement, wholesale lots of 1,000 barrels, f.o.b. Toronto, $1.30.
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Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.20 to $1.25 per ton.
Scotch fire brick, delivered, $30 to $35 per thousand.
Steel channels and beams, $2.75 per 100 pounds, delivered.
Lime, per cwt., delivered, 38 cents.
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Manilla Rope, best, per pound, 15 cents.
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(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $7.50 to $8.00 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Pure Green Seal Zinc White, ground in oil, $12.50 to $13.00 per 100 lbs.
Boiled Linseed Oil, in barrels, 78 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 75 cents per gallon of 9 lbs.
Turpentine, in barrels, 80 cents per gallon of 8 4-10 lbs.
Pure Linseed Oil Putty, 25-lb. tins, $3.25 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $2.75 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

The best treatment for [illegible] floors where the natural color of the wood is to be well preserved, is to apply not less than two coats of bleached shellac varnish to the floor, and three coats are recommended for absolutely good work. As the floor becomes worn, it should be gone over with floor oil at least once a month, the floor oil being composed of 8 pints of raw linseed oil, 2 pints of turpentine, and 1 pint of white or orange shellac varnish. This should be applied with a brush, and rubbed in by wrapping a cloth around a weighted floor brush, so that it will become hard over night, and will not remain sticky. Paraffine oil, used in the same manner, will also clean and freshen up the floor, and in that way prolong the life of the shellac varnish.—Owners' and Builders' Magazine.

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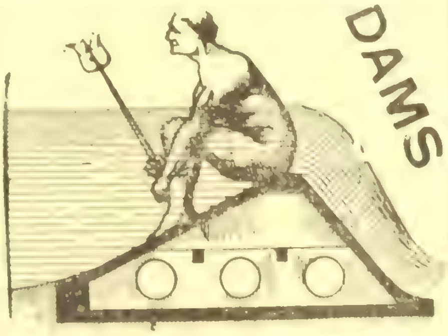

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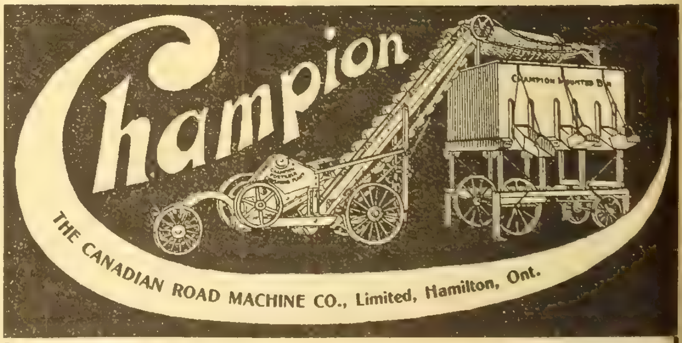
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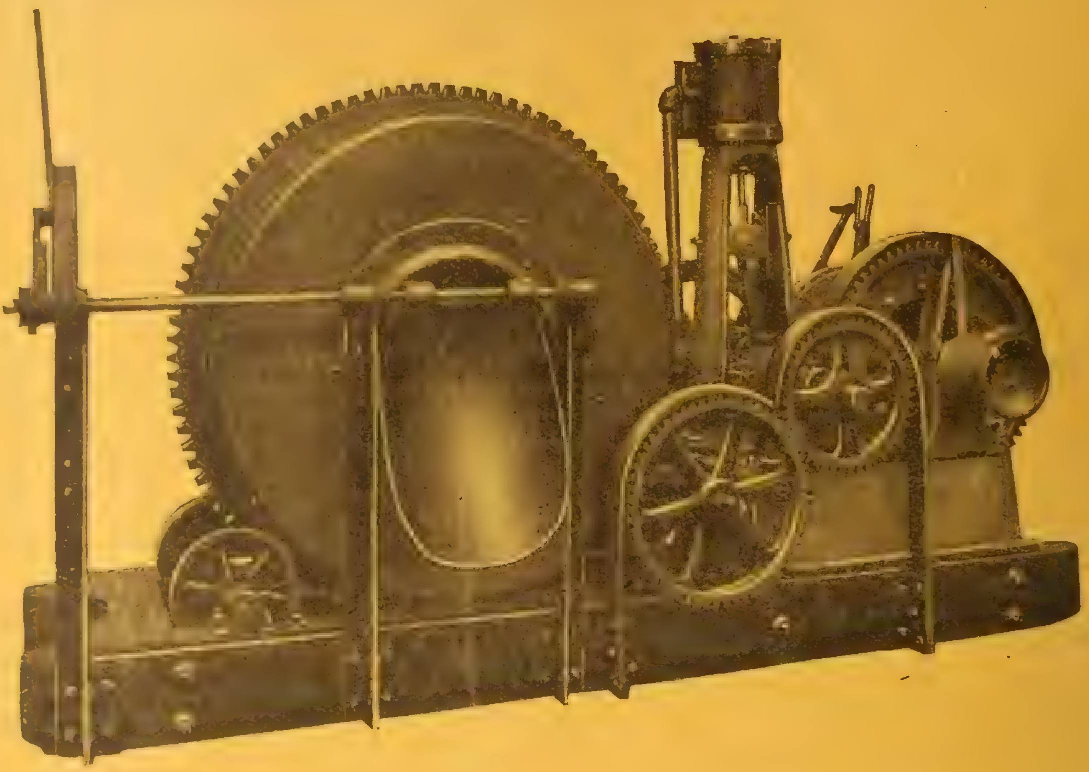

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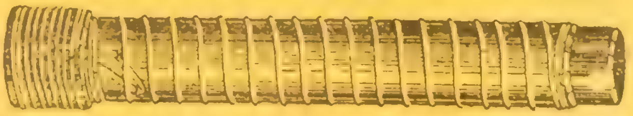

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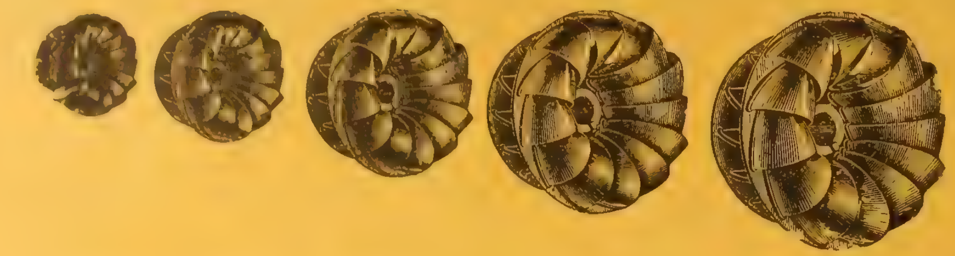

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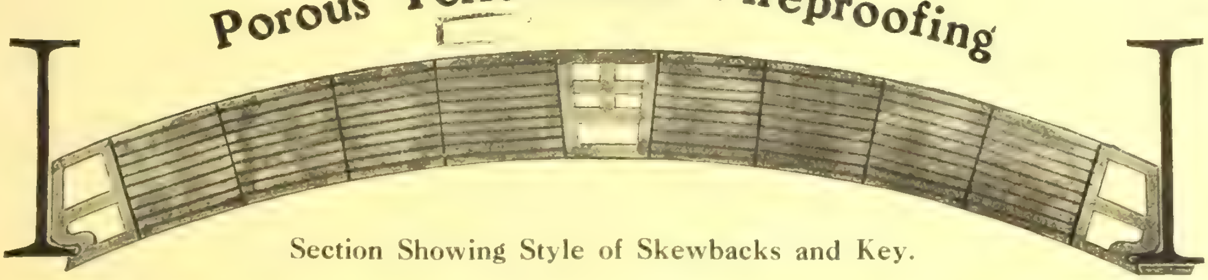

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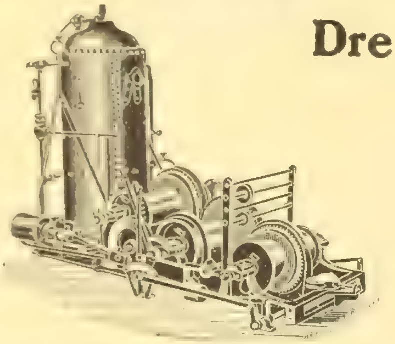

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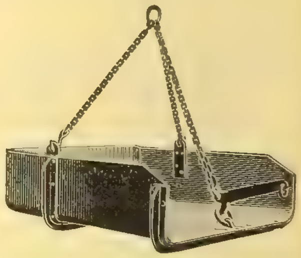

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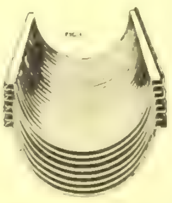

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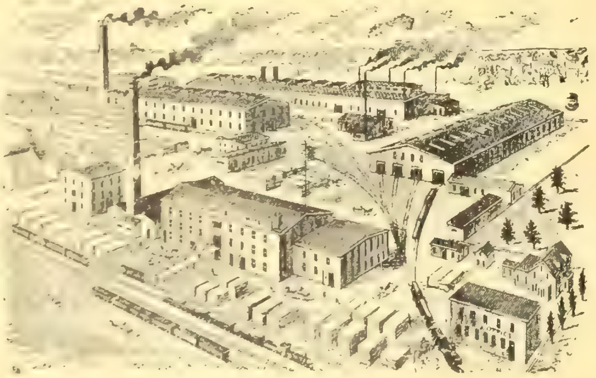

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——Bridge and Construction Dep't.——
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Established 40 Years **Office, HAMILTON CANADA** **Capacity 25,000 Tons per annum**

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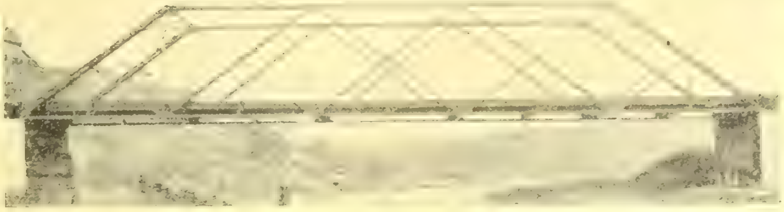

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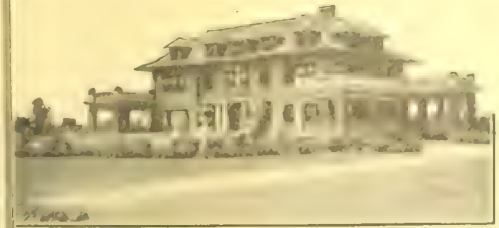

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because they are galvanized in strict accordance with British Government Specifications. Builders would be foolish to buy an inferior brand, when "ACORN" sheets cost no more, and last longer.

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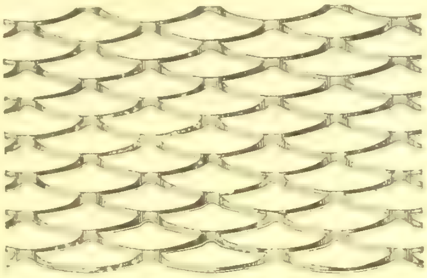
"Galt" Expanded Steel Lath

"Not the First Lath but the First Perfect Lath."



"Galt" Lath is expanded *one mesh* at a time—not stretched one *sheet* at a time. That's why it's flat. In making ordinary metal lath the sheet, which has been slitted, is held by the outer edges and stretched. Soft spots in the steel expand out of proportion with the rest of the sheet and produce "bulges" or "bags." This means a springy, elastic, plastering surface. "Galt" Lath is *flat* and presents a *perfectly level* surface on ceiling or walls. Sample?

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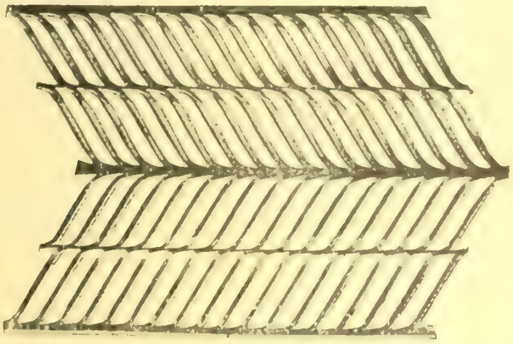

Herringbone Editorials
Number Three

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In 1908 about half the Herringbone output was cold japanned. In 1909 it was ninety per cent. A remarkable increase occurred in the total sales too. There is a moral to this tale for you.

CLARENCE W. NOBLE

GENERAL SALES AGENT

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Metal Shingle & Siding Co., Manufacturers

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is one of the most important materials used in building and therefore the best brand should be employed to obtain successful results.

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has a maximum density and a minimum power of absorption. It is a rich red color, strong and lasts well.

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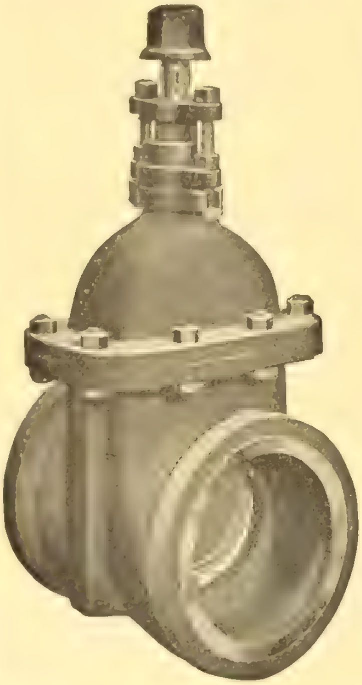

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The Valves with the best reputation and the best reasons for having that reputation.

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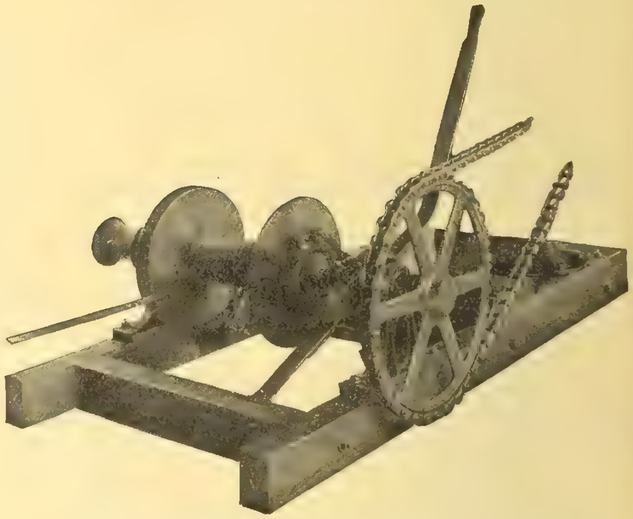

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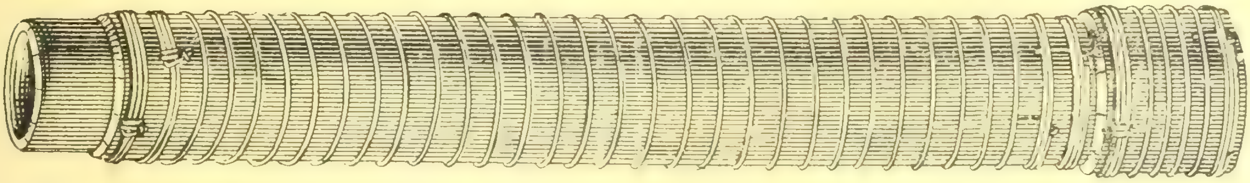
Galvanized Wire Wound and Continuous Stave Pipe for Waterworks, Power and Irrigation, etc., etc.



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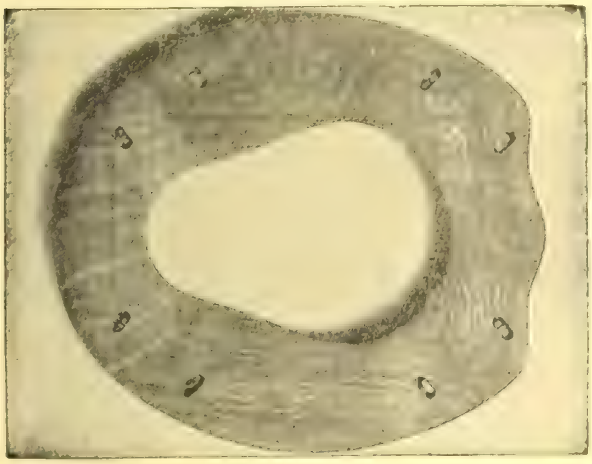

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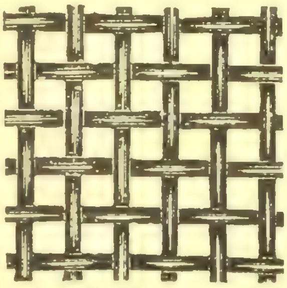

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Sold under a **guarantee** other portlands cannot make in **good faith**. That guarantee is backed by the **oldest** and most **responsible manufacturers in the world.**
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CEMENT ALSEN
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Selected for **PANAMA CANAL** in Preference at Equal Prices and has exceeded those severe requirements.
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Alsen's has now been awarded the largest contract ever let for one brand of cement which specifies 1,100,000 barrels of Portland, the Ashokan Dam, New York State.
The best color and most **durable for cement blocks and sidewalks.**
Write for list of other important works in all sections
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We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

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For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material: best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

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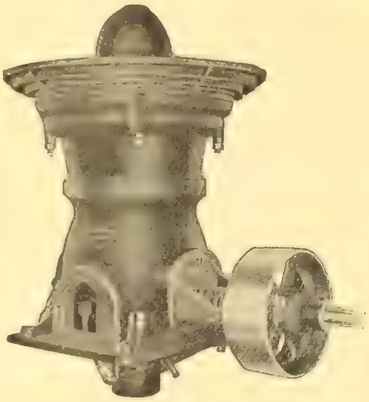

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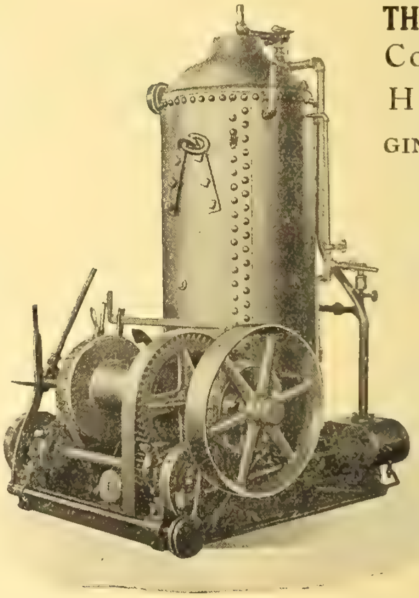
Hoisting Engines

from 4¾ x 6 to 8 x 12 in. IN STOCK FOR IMMEDIATE DELIVERY.



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1910 Patented Trussed 1910

Wire Lath

FOR DESCRIPTION AND PRICES
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Special Bills of Timber in Pine or Hemlock

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Birch Flooring

Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
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Write for particulars and samples.

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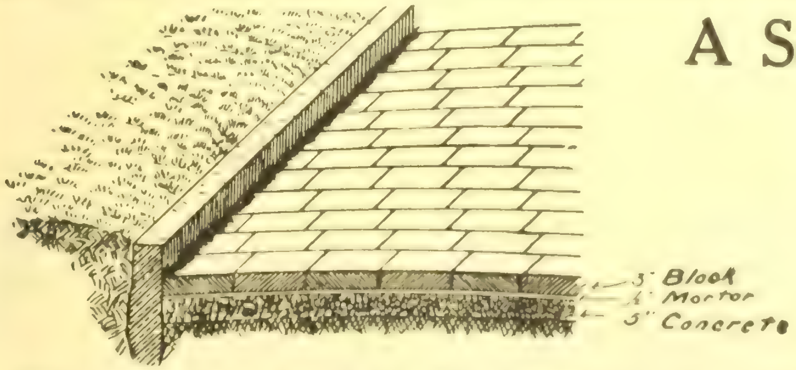

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Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

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Wm G. Hartranft Cement Co. Ltd.
Montreal P.Q.
Sole Selling Agent
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There's a best in everything. There's always a standard by which everything else in the same line is judged. The best cement is

"Vulcan"

Other brands are claimed to be "as good as Vulcan" but why experiment with the "just as good" kind when you can have the standard itself for the asking. Vulcan Cement is

Strong—Uniform—Finely Ground—Carries sand well—Has an exceptionally good color and is positively without any equal for all high-class work.

Always demand Vulcan whether ordering direct or through your Supply House.

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Frames - Sash - Doors
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New and up-to-date Lumber Dry Kilns, ot 200,000 ft. capacity.
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GIVE US A TRIAL ORDER OUR WORK WILL CONVINCE YOU

Georgian Bay Shook Mills, Limited
Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Chilliwack, B.C.

The mayor and city engineer, R. A. Henderson, have been taking levels and formulating a scheme for draining the town of surface waters.

Edmonton, Alta.

J. Galt, consulting engineer, has reported in favor of a project to instal a gravity system water supply.

Kildonan, Man

A bylaw has been passed to raise $10,000 for current expenditure, mainly for gravel roads.

Moose Jaw, Sask.

P. M. Lauder, C.E., of the department of interior, Ottawa, has been examining into the feasibility of a water power on Moose Jaw river, to supply this city.

New Liskeard, Ont.

The bylaw for the borrowing of $28,000 for the macadamizing of Whitewood avenue and Armstrong street, was defeated.

Ottawa, Ont.

The Board of Trade here has asked the government to at once proceed with the Georgian Bay canal if financial conditions permit, or allow work to be done as private enterprise under strictest safeguards.

The Carleton Good Roads bylaw has been ratified by the provincial government, and preparations will be made for the improvement of the roads in Carleton county.

New Westminster, B C.

The Richmond water agreement, whereby this city agrees to supply the neighboring municipality with water has been signed. For $125,000 the city of New Westminster agrees to connect the reservoir at Queen's Park, by a 24-inch steel pipe with the city's waterworks system at Coquitlam lake, and to lay a 12-inch steel pipe from the reservoir to a point near the westerly end of Lulu island, whence the water will be conveyed to the different parts of the municipality of Richmond. The city will keep the pipes in good repair for twenty years. Work will probably be started immediately.

Regina, Sask.

The following will be constructed: trunk sewer, $363,000; pavements and sidewalks, $13,300.

St. John, N.B.

The general committee of the council have asked authority to call for tenders for the permanent paving as recommended by the board of works. City Engineer, Murdoch. Noted in issue of January 5th.

Vancouver, B.C.

A deputation, consisting of City Engineer Clement, Ald. McSpadden and others, waited on the Hon. F. C. Carter Cotton and Attorney General Bowser to request them to use their influence with the provincial government to have the latter construct a large sewer along Nanaimo street, at the city boundary, to Burrard inlet.

Railroads, Bridges and Wharves

Burks Falls, Ont.

The Board of Trade have been influential in having a petition forwarded to the provincial government for a new steel bridge on Ontario street.

Edmonton, Alta.

The sub-structure for the Wolf Creek bridge, it is expected, will be ready for the steel early in the spring. Chas. May, contractor.

Tenders are to be shortly called for the new C. P. R. high level bridge. Noted in issue of January 5th.

Messrs. Phalen and Shirley, of Omaha, Neb., who have the 80-mile contract on the G. T. P. west of the McLeod river, will start hauling in supplies at once.

Fort William, Ont.

The bylaw to raise $12,000 to improve McVicar street subway, has been passed.

The Fort William Coal Dock Company will extend their docks this spring. Cost $100,000.

Kingston, Ont.

Messrs. E. H. Fitzhugh, vice-president of the G. T. R., and H. E. Wittenburger, general superintendent, have been here from Montreal on an official visit. As to the Kingston, Smith's Falls & Ottawa line that is to be built shortly, Mr. Fitzhugh stated that Kingston would be a terminal point for that road.

London, Ont.

It is stated that the G. T. R. yards here will soon be enlarged.

Moose Jaw, Sask.

The Carter-Halls-Aldinger Company, the contractors for the pile work of the new bridge, on Sixth avenue, have begun operations.

Nelson, B.C.

Work is being commenced on the new C. P. R. car repair shop being built to replace the one destroyed by fire. Dimensions 200 by 40 feet. Estimated cost, $3,500.

Prince Rupert, B.C.

It is reported that the G. T. P. will build another wharf at least 1,000 feet long during the coming summer. J. H. Bacon, harbor engineer.

Quebec, Que.

The Cleveland Bridge & Engineering Company, of Darlington, Eng., have been here, it is reported, looking over the site of the big bridge, with the intention of putting in a tender for the work. The Cleveland Bridge Company is one of the foremost concerns in England and has carried out a large number of big engineering works in England, India, Africa and other parts of the world.

Regina, Sask.

It is stated that the [illegible] to be constructed will cost $[illegible]

Sydney, N.S.

The Department of Public Works have sent an engineer to report upon the damage done at Lingan, Glace Bay and other points. It is probable that, as a result of his report, provision will be made for permanent repairs.

Stratford, Ont.

The requets of the Stratford Bridge & Iron Works Company for extension of time for finishing steel work of new Waterloo street bridge has been granted.

St. Catharines, Ont.

It is stated that a company is being formed with a view to erect a high level bridge over the old canal at Yates street to a point leading toward the G. T. P. depot. Ald. W. H. Merritt is reported to be interested.

Victoria, B.C.

Mr. Marpole, general executive assistant of the C. P. R., is quoted as having stated that as soon as they could secure a location in the reserve on Vancouver island being cleared, they would remove their machine shops from Wellington here.

Wm. Mackenzie, D. D. Mann and other C. N. R. officials, have left for the East after completing the terms of the contract with the government for the construction of a line through British Columbia. It is understood that the matter of the regulation of the freight and pasenger rates stands over, and is likely to be left to the railway commission.

Vancouver, B.C.

City Engineer Clement has received notice that the Great Northern has given orders to its engineers to prepare plans for permanent steel bridges over the railway cuts across Park and Victoria drives.

AWARDED.

Adamsville, Que.

Tenders were opened on January 3rd by Mr. E. Vanier, town engineer, for the construction of a bridge over the eastern branch of the Yameska river, and were as follows: Laurentian Construction & Engineering Company, Limited, $9,350; Phoenix Bridge & Iron Works, Limited, $9,750; MacKinnon, Holmes & Company, Limited, of Sherbroke, Que., $9,875; the Structural Steel Company, Limited, $10,600. The contract was awarded to the Laurentian Construction & Engineering Company, who will proceed with the work at once. The contract calls for the completion of the bridge by the 31st of August, 1910.

Saskatoon, Sask.

Strickland Bros. got the contract to erect a foot bridge attachement to the C. N. R. bridge for $2,800.

Winnipeg, Man.

It is reported that the C. N. R. has awarded the contract for the Pembina railway subway to T. Kelly at $60,000.

Owing to a mistake in estimating, J. Gunn & Son, the successful tenderers for additions to Louise street bridge were obliged to withdraw. It is reported that their tender has been [illegible] and the contract awarded to W. Newman, the next lowest, [illegible] over $17,000. Noted in last issue.

Public Buildings, Churches, Schools, etc.

Brandon, Man.
Among the big contracts reported for the coming season are a large wing addition to the Brandon college, and a new convent costing about $50,000.

Brantford, Ont.
Wellington Street Church intend renovating and improving their building. Plans have been practically completed, and tenders will shortly be called.

Beresford, B.C.
Tenders addressed to F. C. Gamble, public works engineer, will be received until January 25th for the erection and completion of a one-room frame schoolhouse at this place. Plans, etc., at office of the government agent at Kamloops, and at the Department of Public Works, Victoria.

Cranbrook, B.C.
As the Fernie Construction Company were found to be not adhering to the provisions of their contract, the school board has taken over the building of the new school, and will complete construction by day labor.

Calgary, Alta.
The Council of Calgary, Alta., is considering submitting a bylaw to raise $105,000 to erect a new city hall. They also recommend that a lot to the rear of the city hall be purchased for $10,000.

Clayoquot, B.C.
Tenders addressed to F. C. Gamble, public works engineer, will be received until January 25th for the erection and completion of a one-room frame schoolhouse at this place. Plans, etc., at offices of government agent at Alberni; John Price, secretary, school board, this place, and at the Department of Public Works, Victoria.

Eastview, Ont.
During the summer holidays the present school house will be removed and a new four roomed brick building erected at a cost of from $10,000 to $12,000. Mr. T. F. Elmitt is interested.

Grande Coulee, Sask.
A four room brick school is to be erected here.

Guelph, Ont.
The Board of Directors of the General Hospital have decided upon the erection of an isolation hospital. The new buildings will have accommodation for twenty-five patients and will be on a site adjoining the general hospital.

Hull, Que.
St. Jean Baptiste Roman Catholic school was destroyed by fire recently. Total estimated loss, [illegible].

Hamilton, Ont.
The Salvation Army has taken out a permit for the alterations to 94 Merrick street, their Industrial Home, for $4,000.

A deputation from the hospital governors waited upon the Board of Control to ask for $25,000 for the erection of an addition to the nurses' home.

In the plans outlined by Erskine Presbyterian congregation for the year is one for a new Sunday school building, to be an addition to the present one.

Kenora, Ont.
Tenders addressed to H. F. McNaughten, secretary, Public Works Department, Parliament Buildings, Toronto, will be received until February 1st for the completion of the Court House here. See advertisement in this issue.

London, Ont.
City Architect Nutter has been asked to prepare plans at once for the Colborne street school.

A proposition is before the council to tear down the market house on the square, part of the space now occupied by it to be reserved for the erection of a registry office.

Meaford, Ont.
The bylaw for the borrowing of $32,000 for the erection of a new public school was defeated.

Montreal, Que.
The Protestant Board of School Commissioners have purchased a school building site in St. Gabriel ward in Point St. Char site in St. Gabriel ward, in Point St. Charles. Chas. D. Binmore, secretary.

Mr. A. F. Dunlop, architect, Lindsay Building, is preparing plans for an extension to the Earl Grey school building and will call for tenders in the course of two or three weeks. The capacity of the present school building will be doubled.

New Westmintser, B.C.
The council will advertise for new tenders for the city incinerator. S. W. Blackman, city engineer.

Nelson, B.C.
D. Guthrie, chief of the fire brigade, has recommended a new central fire hall, and also the purchasing of another 500 feet of hose.

Ottawa, Ont
It may be necessary to call for new plans for the fire station, a technicality having arisen, which renders the present accepted plans of Weeks & Keefer unsuitable. N. H. H. Lett, secretary, Board of Control. Noted in issue of December 22nd.

The Ottawa Methodist Social Union has plans for the erection of two new churches in the coming year, one on the Glebe and the other in Ottawa South. Noted in issue of December 1st.

The city council has appointed a committee to go into the question of the method and cost of providing public lavatories in various parts of the city.

At a meeting of the congregation of Bank Street Presbyterian Church, the trustees were authorized to sell the present property for $125,000, which will be applied to the building of a new church on the corner of O'Connor and Cooper streets. Rev. J. H. Turnbull, pastor.

The congregation of Bell Street Methodist Church will soon be asked to decide on the erection of a new edifice. Estimated expenditure, $30,000. The architecture and construction will be similar to Erskine Avenue Presbyterian Church. Plans and specifications are almost completed.

Prince Rupert, B.C.
The provincial grant to the projected general hospital will be increased in the estimates for the forthcoming session of the legislature from $5,000 to $7,500.

Revelstoke, B.C.
It is stated that the provincial government has promised to erect a new court house this year at a cost of approximately $100,000, and to consider establishing a land registry office.

Stratford, Ont.
The amended plans for the new addition to hospital are awaiting consideration.

St. John, N.B.
Tenders addressed to F. Neil Brodie, architect, 42 Princess street, will be received until January 20th for carpentry, mason work, painting and glazing, and heating and plumbing in connection with alterations to the premises on Market Square, City, belonging to Messrs. J. Morris Robinson & Sons, bankers.

Toronto, Ont.
Superintendent Bishop has been asked to prepare plans for the new Technical school on College street, of which the estimated cost is $500,000.

At a congregational meeting of Bonar Presbyterian church, the building committee recommended that the new church be commenced early in the spring. The plans call for a church to seat 1,000. The cost is estimated at $40,000. Rev. A. MacGillivray, Pastor.

The congregation of Chester Presbyterian church have secured a site for a new church and school building on Broadview avenue. They hope to start the new church in the near future.

Measurments for a planned extension to the wing occupied by the Court of Appeal, Osgoode Hall, have been taken. The plan has not yet been submitted to the Cabinet. F. R. Heakes, architect, Public Works Department.

The Separate School Board passed a bylaw to raise $75,000 for the erection of school buildings and paying off mortgages.

The City Architect has issued a permit to the York Club for proposed alterations to the late Gooderham residence at the corner of Bloor and St. George streets, which is to be transferred into a club house. The alterations will cost $10,000.

Vancouver, B.C.
At the annual meeting of the Strathcona Institute, the president, J. Beveridge, mentioned in his address the prospect of a new building within the year. D. Rorison guaranteed $10,000 on the condition that another $40,000 was raised.

Victoria, B.C.
The congregation of Grace English Lutheran church have secured a building site at the corner of Blanchard and Queen.

The trustees of the Calvary Baptist Church have purchased the northeast corner of Pandora and Quadra streets as a building site.

Welland, Ont.
It is reported that the councils of Pelham and Thorold townships are looking favorably upon the project for a joint rural isolation hospital.

Winnipeg, Man.
The Children's Hospital Board have purchased a building site in the North End.

The Sparling Methodist Church is to be enlarged and improved in the spring.

A proposition has been submitted to the city council, asking that a bylaw be submitted asking the ratepayers to endorse the raising of $350,000 for hospital extensions and imporvements, with the alternative of devoting the sum to municipalizing the present General Hospital.

Plans for improvements to the grounds and club house of the Country Club have been prepared and passed upon by the board of governors. Estimated expenditure $30,000. Final decision awaits a special meeting of the shareholders on the 18th inst.

Yorkton, Sask.
The town council have decided to increase the fire hall accommodation.

AWARDED.

Regina, Sask.
The Emmanuel Anglican College has secured a site on the south side of the university buildings for the erection of a college. Brown & Company, the university architects, were awarded the contracts for the plans. A $50,000 building is to be erected in the spring.

St. Albert, Alta.
Poirier Bros. have been awarded the contract to build the new school house.

Toronto, Ont.
Mr. Samuel Young, Hazelton avenue, has been awarded the contract for the remodeling of the Toronto General Post Office on Adelaide street. A new wing will be added on the east and the present structure considerably improved. The work will cost $46,000, and will be started early in the spring.

Residences

Brandon, Man.
Henry Gillespie will erect a $5,000 residence and has taken out a permit.

Bathurst, N.B.
Two houses belonging to the Nepisguit Lumber Company were destroyed by fire on the 12th inst. Estimated loss, $2,000.

Lethbridge, Alta.
R. I. Gold is erecting a $3,000 residence.

Ottawa, Ont.
It is reported that the Vacuum Cleanser Company is seeking to locate a Canadian branch here.

It is stated that the building at 113-115 Sparks street, now occupied by the firm of A. Rosenthal & Sons, Limited, has been sold to Messrs. G. and M. Orme, piano dealers, 139 Sparks street. The former have plans for a large building on the site of the stores from 101 to 107 Sparks street. Estimated expenditure, $100,000. Construction will probably commence on the 1st of May.

Regina, Sask.
D. J. McKay, of the McKay Construction Company, has purchased for an American syndicate, 150 feet opposite Victoria park, where an apartment block costing $150,000 will be erected as soon as spring opens.

Vancouver, B.C.
The Church Committee of St. John the Divine, Central Park, have plans prepared for a new clergy house.

Richard T. Perry has just completed plans for two six-roomed bungalows to be erected at South Vancouver. The contract has been let to Domoney & Abbot. The same architect has let the contracts for an eight-roomed bungalow to be erected at Cedar Cottage, to Orenden & Braithwaite.

A. C. Hope, architect, is calling for tenders on the alteration and addition to a house for C. A. Fraser.

Winnipeg, Man.
Plans are being prepared by W. W. Blair, architect, for the large apartment house south of the Carnegie library to be erected by G. H. Walton, real estate agent. Dimensions, 200 by 150 feet. Estimated cost, $320,000.

AWARDED.

Toronto, Ont.
J. Berridge & Company have been awarded the contract for all trades excepting those of plastering and painting, required for a large residence for Mr. Bertram on the west side of Rusholme Hill road, at $7,000. Architects, Chapman & McGiffin.

J. Berridge & Company have been awarded the contract for all tardes required in the erection of additions to apartments at southwest corner of Gloucester and Church streets.

Business Buildings and Industrial Plants

Amherstburg, Ont.
The Anglo-American hotel was destroyed by fire on the 10th inst. Estimated total loss $20,000.

Augustin, Que.
A. Beaumont's sawmill, near this town, was destroyed by fire on the 9th inst. at a loss of about $6,000.

Brandon, Man.
McDiarmid & Clark are to erect a large sash and door factory in the spring.

It is said that Townsley & Son, Minneapolis, have secured a site here for a factory building.

The store of A. D. Rankin & Company is to be enlarged and refitted extensively. Work starts January 31st.

Brockville, Ont.
The building recently erected on the Gossitt Company's premises, used as a paint shop and storeroom, was destroyed by fire on the 13th inst. Total estimated loss, $6,000.

Edmonton, Alta.
Plans are being prepared for an eight-storey Chamber of Commerce building.

Emerson, Man.
The Northern Elevator's storage elevator was destroyed by fire. Loss estimated at $30,000.

Fort William, Ont.
It is reported that Mr. F. C. Becker has stated the intention of the company is to electrify the works at the mine and to build a crusher here. Mayor Peltier is reported to have stated that a new proposition will be presented to the Pyrites company and the idea of locating the company headquarters here has not by any means been abandoned.

Lethbridge, Alta.
W. Oliver will build a five storey business block in the spring.

The Western Farmers' Milling Company will erect several elevators in Alberta.

The A. Macdonald Company, wholesale grocers, has decided to erect a building for a branch establishment here. A site has been secured 50 by 120 feet and the structure will be of four storeys and costing about $25,000.

London, Ont.
The Watt Manufacturing Company, of Ridgetown, Ont., are negotiating with a view to locating here.

Montreal, Que.
The Diamond Flint Glass Works were damaged on the 16th inst. to the extent of about $30,000.

It is stated that the Ross Company has purchased the Academy of Music, of which at the end of the present lease in April next, they will take possession.

Moose Jaw, Sask.
The Geo. Campbell Company will erect extensive warehouse and office here next spring.

The Moose Jaw Grocery Company and the Elsom Apartment block have excavation and basements ready for spring building.

The Imperial Oil Company, of Winnipeg, Man., has made the purchase of six lots, and as soon as weather permits will begin the construction of a large warehouse, and other buildings. The site is west of Saskatchewan Flour Mills. Estimated cost of main building, $10,000; of other buildings, $15,000. W. Yeo, local manager.

New Westminster, B.C.
The Alberta-British Columbia Elevator & Wharf Company is quoted as having stated that having been promised aid from the Alberta government, they would erect a large grain elevator here, probably before next summer. E. H. Heaps, of Vancouver, is interested.

A manufacturing site in the east end of Sapperton on the Great Northern tracks has been secured on a short option by the Western Canada Envelope & Stationery Company, of Vancouver. If the plans of the company go through it is understood that construction will be started in the spring.

It is reported that the northeast corner of Musgrove and Rideau streets, now owned by Hugh Carson, Limited, has been bought by the George Matthews Company. Plans, although not definite, are thought to embrace a brick block for their retail trade.

It is reported that the Peter Whalen property on the southeast corner of Rideau street and King Edward avenue, has been purchased by the Hugh Carson, Limited, as a site for the company's new factory, which it is stated will be six storeys in height. Work will be started at once.

Tenders addressed to G. J. Desbarats, deputy minister of Marine and Fisheries, Ottawa, will be received until February 8th for the construction of a wooden coal shed at Cape Sable Lightstation, Shelburne County, N.S. Plans, etc., at that department and at its agency, Halifax, N.S., and at the post offices, Barrington, Shelburne and Yarmouth.

Peterborough, Ont.
It is reported that plans are being prepared for extensive additions to the buildings of the Canadian General Electric Company here.

Quebec, Que.
The office of "La Vigie" was damaged by fire to the extent of about $2,500 on the 16th inst. Mr. Ulric Barthe, editor.

Regina, Sask.
Armstrong, Smyth & Dowswell, hardware merchants, plan to erect a three storey brick block.

A site has been purchased from J. B. Shaw for a large office building to go up in the spring.

F. M. Crapper will have two buildings erected. One is to be a large business block, and the other a two storey brick structure.

Saskatoon, Sask.
Plans for the [illegible] building are nearly completed. Construction will begin March 1st.

It is stated that as a result of the amalgamation of the interests of the [illegible] Milling & Elevator Company and the Wil-

[illegible] Company, this city, are to have a big new flour mill, which will be one of the largest in Western Canada. Tenders have been called for machinery and building, and the work will commence at once, besides the mill proper, there will be a big elevator in connection. The company has already a line of elevators, which will be extensively added to.

Sturgeon Falls, Ont.

The Windsor Hotel, the Cockburn block, post office and other buildings were destroyed by fire on the 9th inst. Total estimated loss $25,000.

Strathmore, Alta.

It is stated that those interested in oil plants in Winnipeg are planning to locate a 10,000 gallon storage house here.

Stratford, Ont.

The Imperial Rattan Company, it is stated, will remove here from Walkerville.

St. Boniface, Man.

The stock yards plans will entail a total expenditure by the company, the town and the railways, of over one million dollars.

The Western Canada Flour Mills are planning extensive additions and improvements to their big flour mills there. Estimated expenditure $250,000. A. Kelly, president; S. A. McGaw, general manager.

Souris, Man.

The C. P. R. has purchased four hundred acres adjoining this town, presumably for a shop site to serve the southwestern lines which converge here.

Toronto, Ont.

The Standard Sanitary Company have obtained a permit for the erection of a factory at the corner of Lansdowne and Royce avenues at $12,500.

Tenders will be received by Darling & Pearson, architects, 2 Leader Lane, until January 31st, for all the various trades required in the erection of a branch building for the Canadian Bank of Commerce at the corner of Bloor and Dufferin streets. Plans and specifications at the office of the above mentioned.

It is reported that a strong and influential syndicate, headed by John W. Gates, the Chicago millionaire, and prominent German financiers, has been formed for the purpose of erecting in the vicinity of Toronto a modern smelting plant. Plans for the proposed plant are now being prepared in Ottawa.

Vancouver, B.C.

The Royal Bank of Canada are having improvements made to their building on the corner of Hastings and Homer streets.

A building of ten storeys and 50 by 100 feet, plans for which are now being prepared, is to be built at the eastern end of Woods hotel. It is estimated that the cost will be $200,000 and over. Mr. Houghton, architect.

John Considine, owner of the Orpheum circuit, has secured options on property in the centre of the city, where he intends to erect a $50,000 theatre.

The contractors are to commence work on the addition to the premises of Kelly, Douglas & Company, during the course of the month. Estimated expenditure, $80,000. Mr. R. Kelly is interested.

Victoria, B.C.

Adkinson & Dill, contractors for Times building, require tenders for excavation, cut stone, electric work, sheet metal and roof, lumber, cement, sand, gravel and iron work. For particulars apply to H. S. Griffiths, architect.

A permit for a $30,000 building of brick and concrete to be erected on the lot just south of the Merchants Bank building on Douglas street has been taken out by A. C. McCallum. J. L. Skene has the contract. The building will be constructed of brick and concrete and will be fireproof.

The Bank of Montreal, it is stated, have bought the lot on Government street, adjoining their own premises. It is assumed that the purchase has been made with a view to future enlargement of building when the need occurs.

Wynyard, Sask.

Bjorndson & Brickson's general store was destroyed by fire recently. Total estimated loss, $12,000.

Watrous, Sask.

The Massey-Harris Company are to erect a $20,000 distributing warehouse on First avenue in the spring.

J. Cummings, real estate agent, has sold three lots on Second avenue, as a site for a general store, with a 75 foot frontage.

Winnipeg, Man.

Options have been secured on the block bounded by Graham and St. Mary's avenues and Donald and Hargrave streets, through Oldfield, Kirby & Gardner, who, it is supposed are acting for the T. Eaton Company.

It is reported that the Trust & Loan Company have purchased an additional 33 feet just east of the Dominion theatre, making their frontage now 100 feet. No definite plans have been stated re the building to be erected, but it is understood that it will be of fireproof and of large dimensions.

On March 1st contractors will take possession of the old Canada Permanent building on the southeast corner of Main and Portage, and begin tearing it down to prepare for the erection of the magnificent new Bank of Montreal building. Noted in issue of December 22nd.

The factory of the McDonald Tent Company, on Logan avenue, was destroyed by fire on the 11th inst. Total estimated loss $15,000.

A business block is projected for the corner of Portage avenue and Home street.

The Radium Oil & Chemical Works will put up a factory next spring. D. M. Bruce is manager.

The Paulin Chambers Company will have a six storey building put up, 60 by 120 feet. F. R. Evans, architect.

The W. B. Sterling & Company will rebuild their six storey warehoues. Tenders will be called soon.

The Frost & Wood and Cockshutt Plow Company, having combined, will erect a number of warehouses in the West next spring.

Extensive work in connection with additions and improvements to C. P. R. hotels have been outlined by Hayter Reed, superintendent of the company's hotels, who is on a tour of inspection in the West. According to plans now being prepared the capacity of the Hotel Vancouver will be doubled. Important alterations and additoins to the company's hotels at Lake Louise, Glacier, Sicamous and Banff are in prospect.

Tenders for supply of 129 feet of 26-inch 8-ply elevator belting delivered at the City Quarry, Stony Mountain, will be received until January 28th. M. Peterson, Secretary, Board of Control.

Yorkton, Sask.

The wholesale fruit warehouse occupied by Wilton Bros., was destroyed by fire recently. Estimated loss to building, $5,000.

AWARDED

Fort Erie, Ont.

Clarkson & Sons, contractors, Toronto, have secured the contract to erect the casino building, in connection with the hotel at the Beach, which will be built of reinforced concrete and steel, at a cost of about $50,000.

Montreal, Que.

Mr. H. C. Stone, architect, 80 St. Francois Xavier street, has awarded the contract for the artificial stone work on the Beardmore building, to the Roman Stone Company, of Toronto.

Sault Ste. Marie, Ont.

General manager Franz, of the Lake Superior Corporation, has awarded the contract for the construction of coke ovens to the Kopper Coke Oven Company, of Joliet, Ill., and construction is to commence immediately. Price was not stated, but it is thought to be $2,000,000.

Power Plants, Electricity and Telephones

Cranbrook, B.C.

The Kootenay Telephones, Limited, this place, is considering the advisability of building a line to Grande Prairie.

Calgary, Alta.

City Engineer Child, in a recent report to the commissioners, pointed out the advisability of establishing a new power plant without delay, and suggests a site in Victoria Park as suitable.

Edmonton, Alta.

Plans have been prepared by Superintendent Taylor, for a new car barn to hold 100 cars. Only half of the building will be erected this year.

Fort William, Ont.

The following bylaws were carried: $21,000 to extend telephone system; $14,000 to extend electric system; $137,000 to further extend steel railway; $6,000 to purchase Bell Telephone.

London, Ont.

New tenders will be invited for the electrical equipment required at the power station. The former specifications are said to have contained too many alternative propositions. The machinery required includes transformers, motor generator set, voltage regulators, switchboards, lightning protectors, instruments, arc and incandescent street lighting system. E. J. Sifton, chief electrical engineer. Noted in issue of December 8th.

Melville, Sask.

The citizens of Melville have passed the electric light bylaw which gives Messrs. Cushing and Weira franchise, but not an exclusive one, to erect an electric light and power plant. Work will be commenced at as early a date as possible, and the plant has to be in operation by July 1st, 1910. Estimated expenditure, $30,000.

Midland, Ont.

Tenders are being invited for hydraulic and electrical equipment by W. Finlayson, secreary of the Simcoe Railway & Power Company, Limited. For further particulars, see advertisement in this issue.

New Westminster, B.C.

It is stated that work on the new station will commence in February. This will require an expenditure from $60,000 to $70,000.

Ottawa, Ont.

The Arnprior & Pontiac Electric Railway Company is stated to be organized for the purpose of building an electric railway from Campbell's Bay, Que., via Chats Falls and Graham's Bay, near Ottawa, Ont., to High Falls, 75 miles. Arthur H. Brice, Ottawa, Chief Engineer.

The plans for the development of power at the Long Sault Rapids in the St. Lawrence, at Cornwall, Ont., are now before the chief engineers of the three departments of the Dominion Government having oversight in the matter, the departments of canals, marine and public works. Elaborate plans and drawings, in detail, have been filed and they show three distinct dam proposals, each with a different elevation. The engineers will advise the government in respect to them, and the government will then decide which plan will be followed. Four power houses, three on the American side of the river and one on the Canadian side, are shown, and, roughly speaking, about 125,000 horse power is proposed at the outset. This may be largely increased. The plans will also go before the International Waterways Commission for approval.

Prince Albert, Sask.

It is reported that the provincial government will spend about $20,000 on the telephone plant. The wires in the business section will be put underground, and if a suitable site can be procured, a new building will be erected.

The farmers in the Colleston district, north of here, have decided upon a rural telephone system, work on which will be started early in the spring. George Reid, who is in charge of the system, can be addressed at Collaston, P. O., Prince Albert, Sask.

Revelstoke, B.C.

The city council have decided to enter into a five-year contract to supply the C. P. R. with power from the 1st of May at $2 25 per kilowatt hour for from 75 to 150 horse power. A new power plant is being installed by the municipality.

The plans of the B. C. Electric Company now call for the sub-station, which was to have been built at Sardis, to be erected here of cement concrete, four storeys in height. In addition to this a building will be erected for the chief of the power house. Estimated expenditure, $80,000. Superintendent, Mr. Purvis.

Winnipeg, Man.

The plans for the new North End Telephone Exchange are under way. Work will not be started until spring.

AWARDED.

Calgary, Alta.

Walter Fyshe Company, of Montreal, Que., have been awarded the contract for the general work in connection with the plant to be erected by the Calgary Power and Transmission Company. Construction will start in the spring.

It is reported that the General Electric Manufacturing Company of Sweden is supplying the Calgary Power & Transmission Company, with four 750-kilowatt water cooled, step-down transformers. Smith, Kerry & Chace, of Toronto, Ont., are the consulting engineers.

New Westminster, B.C.

T. R. Nickerson & Company has been awarded the contract for building five substations for the British Columbia Electric Railway Company in connection with its line between New Westminster and Chilliwack. The price is $225,000, and work will start at once.

Victoria, B.C.

The B. C. Electric Railway Company, Limited, called some time ago for competitive plans for a new building for their head offices there, and fourteen architects submitted plans and drawings. Of this number those filed by Mr. Griffiths have been awarded first place by the judges, and the first prize of $500 has been given him.

Winnipeg, Man.

Contracts in connection with the power house right of way from Point du Bois to the city's power house have been awarded as follows: Wire fencing and gates to the Canadian Steel & Wire Company at $3,348; posts to Weatherby & Eklund at $2,298.

Miscellaneous

Brandon, Man.

The following are some of the items being considered by the Council: To consider the advisability of establishing a street railway in the city;of furnishing light for street and domestic use; of needed improvement to the city hall and opera house and the improvement of the heating system; of paving Rosser avenue and other thoroughfares.

Manitou, Man.

Tenders will be received until February 1st for $15,500 5 per cent. 20-year local improvement debentures. Geo. T. Armstrong, clerk.

Montreal, Que.

Tenders addressed to D. Seath, secretary-treasurer, Harbor Commissioners, of Montreal, will be received until January 26th for steel hull and boiler for boom dipper dredge. Plans, etc., upon application to F. W. Cowie, chief engineer.

Recent building permits include: D. Murray, 75 Pathenais street, house containing three dwellings, $4,500; A. Lusignan, 385 Plessis street, house containing five dwellings, $3,500; F. L. Desaulniers, 1373 Pathenais street, house containing five dwellings, $4,000; L. P. Damphousse, 216 Dufferin, house containing five dwellings, $4,000; F. X. Craig, 387 Mt. Royal avenue, store and dwelling, $5,000; Dubec & Chateauvert, 1125 Delormiere avenue, house containing three dwellings, $4,000.

Ottawa, Ont.

The Department of Railways and Canals are calling for tenders for supply of cement required for the construction, etc., of the canals of the Dominion of Canada. Further particulars in advertisement in this issue.

Sorel, Que.

Tenders addressed to G. J. Desbarats, deputy minister of Mairne and Fisheries, Ottawa, Ont., will be received until January 29th for supplying 75,000 cubic feet of round white pine timber, and also for supplying 12,500 cubic feet of round spruce timber, to be delivered at the government shipyard here. Specifications obtained from the Purchasing and Contract Agent, Marine and Fisheries Department, Ottawa.

Toronto, Ont.

It is reported that a firm of British contractors have communicated with Mayor Geary with regard to a project to widen and deepen the Welland canal. It has been referred to the Special Committee for the improvement of navigation on the St. Lawrence and Great Lakes.

Recent building permits include: Holt, Renfrew Company, alterations to store, corner of Yonge and Adelaide, [illegible]; [illegible] Maynard, two storey brick store and dwelling, corner [illegible] and [illegible], [illegible]; R. [illegible], five detached two storey roughcast dwellings, brick fronts, corner Pape and Strathmore, [illegible]; [illegible] pair semi-detached two storey brick dwellings, Howard Park, $4,000; E. C. Finch, pair semi-detached two storey brick dwellings, Glendale, $4,000; W. Bulmer, two and a half storey brick dwelling, Sunnyside, $3,400; W. J. Leach, two and a half storey brick dwelling, Geoffrey street, $4,500; E. & N. Bryson, two storey brick store and dwelling, Bloor street, $3,000; Henry E. Crockford, two storey brick dwelling, Wineva, $2,700; J. McCullough, one and a half storey brick dwelling, Albermarle avenue, $2,500; W. H. Maughan, two storey brick dwelling, near Roncesvalles, West Marion, $2,500; T. F. Black, two and a half storey brick dwelling, Marguerettá street, $2,500; G. Jackson, Jr., two and a half storey brick dwelling, Dufferin, $2,500.

Vancouver, B.C.

A building permit for an eight storey steel frame structure has been taken out by Miss R. Leigh Spencer, costing $80,000. Other permits granted recently include: J. Brown, 2427 Granville street, $2,000; British Columbia Electric Railway Company, extension to its plant at the foot of Barnard street preparatory to the installation of its new steam auxiliary plant, $6,000; Capt. A. Cooper, 1390 Fourteenth avenue west, $3,500; Arbuthnot Sash & Door Company, 2051 Tenth avenue west, $2,600; W. L. Carley, 1746 Tenth avenue west, $2,600; i. Rusesll, 1729 Grant street, $4,000; A. J. Coles, 1924 Second avenue east, $2,000; N. J. McArthur, 2365 Seventh avenue west, $2,500; G. Tyson, 2016 Keefer street, $2,000; G. H. Eaton, 234 Fifteenth avenue west, $2,300; Stevenson & Doctor, 430 Lakewood drive, $3,000; S. Irwin, 376 Fifteenth avenue west, $3,000; B. C. Mattress Company, frame factory, 315 Front street, $8,000; D. A. Acorn, frame dwelling, 2504 York street, $3,500; W. G. Hetherington, dwelling, 2735-2747 Alder street, $12,000; F. Graham, three dwellings, Semlin drive, $4,200; J. Brown, frame shop, 2427 Granville street, $2,000; A. J. Coles, dwelling, Second avenue, $2,000.

Victoria, B.C.

Building permits have been issued recently to Henry Young & Company for alterations to premises on Government street to cost $3,000; Iian Epperson for a dwelling on Dunedin street of six rooms, $21,000; and to Alex. McCrimmon for a house on Vining street, to cost $2,500.

AWARDED.

Ashcroft, B.C.

Alex. Watson has received the contract for the construction of a high-powered and shallow-draught sternwheeler to be used next summer in the interior waterways of British Columbia, to operate between Soda Creek and Fort George for the British Columbia Express Company. Estimated cost $40,000. It is probable that a second steamer will shortly be commenced. There is, too, talk of another steamer to be constructed here for esrvice on the Skeena river.

The B. C. Gazette gives notice of the incorporation of the following companies:—B. C. Ornamental Iron & Fence Company, Limited, capital $10,000; Paterson Contracting Company, Limited, capital $25,000; Port Alberni Contract Company, capital [illegible] [illegible], Limited, capital $25,000; Kernaghan Lumber Company, Limited, capital $25,000; Fraser River Brick & Tile Company, Limited, capital [illegible]; [illegible] Shingle Company, Limited, capital [illegible]; [illegible], Limited; incorporated to build, equip, furnish, etc., mills, warehouses, capital $300,000; Vancouver [illegible] Company, Limited, capital [illegible].

Tenders and For Sale Department

Proposals

Tenders are wanted for approximately 8,000 k.w. of [illegible]

[illegible] apply at once to ELECTRICAL DEPARTMENT, City Hall, Toronto, Canada. 5

Department of Railways and Canals

Dominion Canals

Notice to Dealers in Cement

Sealed tenders endorsed "Tender for Cement" will be received by the undersigned, up to 16 o'clock on FRIDAY, THE 28TH OF JANUARY, 1910, for the supply of some 140,000 barrels of Cement, more or less, required for the construction and maintenance of the various canals of the Dominion and to be delivered in such quantities, at such places and at such times as may be directed.

Dealers in cement may tender for the total quantity required, or for such portions thereof as may suit their convenience.

Specifications, forms of tender and full information can be obtained at the Department of Railways and Canals, Ottawa, on and after this date

The Department does not bind itself to accept the lowest or any tender.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 12th January, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 4

The Simcoe Railway and Power Company, Limited, Midland, Ontario

Tenders for Hydraulic and Electrical Equipment

Sealed tenders endorsed "Tender for Hydraulic Equipment," or for other respective sections, will be received by the Secretary of the Simcoe Railway and Power Company, Limited, at the Head Office, Midland, Ontario, until February, 1st., 1910 for the following:—

For Generating Station at Big Chute, Severn River.
- Hydraulic Equipment
- Penstocks
- Electrical Equipment

For 27 Mile Transmission Line
- Wire
- Insulators
- Crossing Towers

For Receiving Station at Midland
- Electrical Equipment

Specifications for the above may be seen at the office of the Secretary, Midland, Ontario, or at the office of Engineers, C. H. & P. H. Mitchell, Traders Bank Building Toronto, Ontario. No tender necessarily accepted.

W. FINLAYSON,
Secretary.

Midland, January 6th, 1910. 4

To Contractors

Tenders addressed to Mr. H. F. McNaughten, Secretary, Public Works Department, Parliament Buildings, Toronto, will be received at this Department until NOON OF TUESDAY, FEBRUARY 1ST, for the completion of the Court-House in Kenora.

Contractors tendering are required to inspect the building, all the cement work having been done last year, and some of the stone work. A quantity of the materials is also on the ground ready for use, including stone and lumber. Contractors to allow for these in their tenders.

Plans, specifications and detail drawings can be seen at this department, and at the office of the Sheriff, Kenora.

Each tender must be accompanied by an accepted bank cheque, payable to the order of the Hon. J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender, and the bona fide signatures and addresses of two sureties, or the name of a Guarantee Company approved by the Department, prepared to give a bond for the due fulfillment of the contract. Cheques will become forfeit to the Crown in the event of the successful tenderer refusing to carry out the work within ten days after the acceptance. The Department will not be bound to accept the lowest or any tender.

J. O. REAUME,
Minister of Public Works.

Department of Public Works, Ontario,
Toronto, January 12th, 1910.

Newspapers publishing this advertisement without authority will not be paid for it. 3

Situations Wanted

ARCHITECTURAL ENGINEER—Graduate C. E., wants detailing, checking, designing. Consultations, structural or bridges, 12 years' American practice; thoroughly competent; best references. Box 893, CONTRACT RECORD, Toronto, Canada. 3

Situations Vacant

WANTED — Architectural Draughtsman, middle-aged, capable of supervising construction, state experience, salary expected, etc., Position to be filled at once. W. W. LA CHANCE, Architect, Saskatoon, Sask. 4

New Companies

Redington Rock Drill Company, Limited, St. Catharines, Ont., incorporated, capital $100,000. Incorporators: R. W. Leonard, civil engineer, J. J. Mackan, accountant, and H. H. Collier, all of St. Catharines.

St. James Construction Company, Limited, Montreal, Que., incorporated, capital, $125,000. Incorporators: C. A. Duclos, K.C., Westmount; W. L. Bond, J. J. Meagher, advocates, both of Monteral, Que.

Lafrance Improved Pipe Joints Company Limited, Montreal, Que., incorporated, capital $50,000. Incorporators: J. Lafrance, plumbing contractor, A. Chagnon, general contractor, and L. D. Latour, real estate agent, all of Montreal.

Blair Engineering Company of Canada, Limited, Montreal, Que., incorporated, capital $100,000. Incorporators, W. Johnson, merchant, A. LaRocque, civil engineer, both of Montreal, Que.

Eastern Electric & Development Company, Limited, Sackville, N.B., incorporated, capital $250,000. Incorporators: C. W. Fawcett, stove manufacturer and C. Pickard, both of Sackville, and W. I. Snook, electrician, of Truro, N.S.

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New French Concrete Pavement

A recent French invention in paving consists of imbedding in concrete fine iron shavings, or iron excelsior. The metallic shavings ordinarily come in sheets or masses, which can be broken apart with difficulty owing to the intertwining of the filaments, and which are somewhat elastic. In constructing paving blocks a mold is filled with these iron shavings and the interstices filled with cement grout sufficiently fluid to penetrate the entire mass. The blocks thus formed are said to possess great strength and resistance to abrasion, and also (what seems less credible) elasticity under blows or jarring. Tests made of such blocks are said to have shown a resistance to compression of about 150,000 pounds per square inch, and a tensile strength four times that of neat cement. One advantage claimed for this paving is that joints may be almost eliminated, thus doing away with the points where greatest destruction generally occurs. Nothing is said of the opinion which would probably be entertained of this pavement by a contractor who might be required to cut a trench through it. The cost of construction is said to be the same as that of ordinary macadam; but this would depend largely upon the cost of the iron shavings.

F. F. Taylor, plumber, St. Paul, Que., is stated to have assigned.

M. Guenette, lumber merchant, Montreal, Que., is stated to have assigned.

Geo. Wright, lumber merchant, Odessa, Sask., is stated to have assigned.

Alexis Gagnon, contractor, Montreal, it is stated, has been asked to assign.

The Austin Lumber Company, Cap. St. Ignace, Quebec, is stated to be in liquidation.

The Pioneer Lumber & Implement Company, Limited, Moose Jaw, Sask., have sold out to F. J. Grobb.

The wooden pipe required for the new water works system at Vernon, B.C., was manufactured by the Dominion Wood Pipe Company, of New Westminster, B.C. This material stood the remarkable test of a 300-foot head being turned on full to a 100-foot head pipe.

The Manitoba Gazette gives notice of the incorporation of the Wood-Vallance, Limited, Winnipeg, Man., to acquire the business of Geo. G. Wood & Company. Directors include W. Vallance, G. Vallance, wholesale hardware merchants; W. A. Wood, wholesale hardware merchant, Hamilton, Ont.; D. Wood, merchant, Winnipeg.

We Have Always in Stock:

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Foot of Bathurst St.
Foot of Church St.
256 Lansdowne Ave.
C.P.R. Crossing North Toronto
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Creosoted Wood Paving Blocks

cut from the log in our own mills out of live Douglas Fir and creosoted to specification as to Oil and Pressure. Capacity 1,000 yards per day.

Bridge, Structural and Mining Timbers

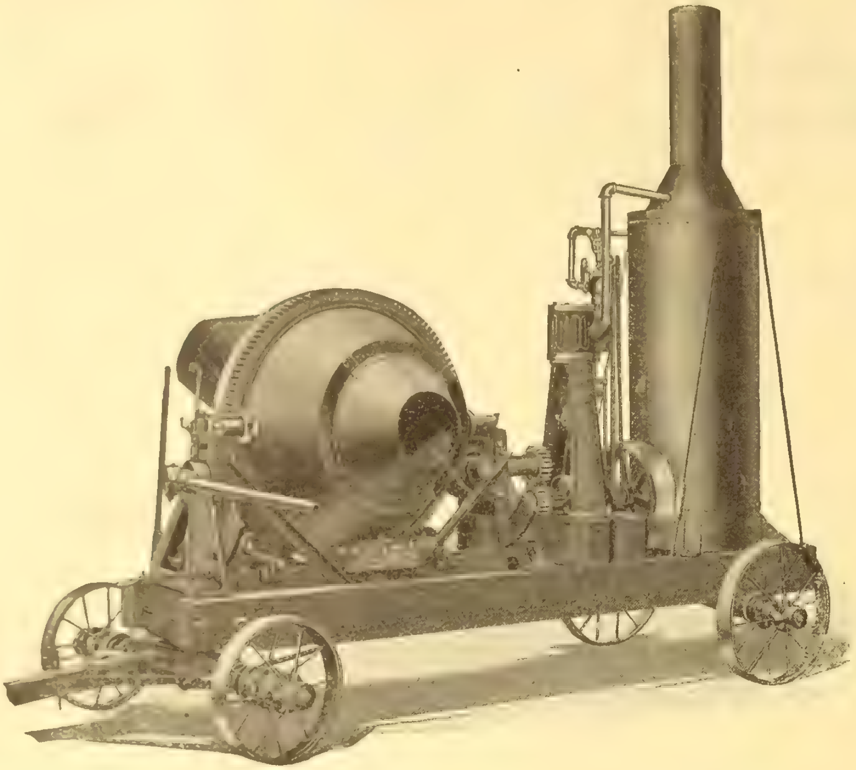
cut and sized to exact dimensions and if so desired, framed in our yards before Creosoting.

Standard Creosoted Railroad Ties

Capacity after March 1st, next, 1,200 ties per day.

Dominion Carbolineum Works Limited

Vancouver, B. C.



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Mixers have been unable to complete the job
put on, but out of nearly 4,000 SMITH MIXE
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us tell you more about them.

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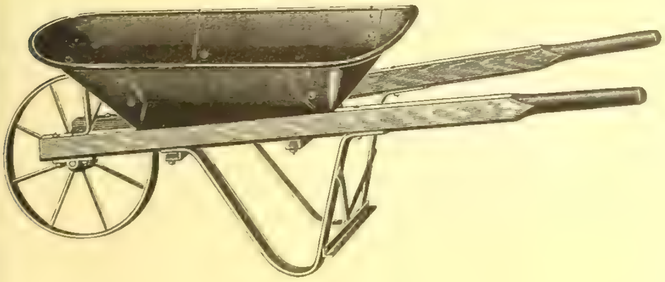

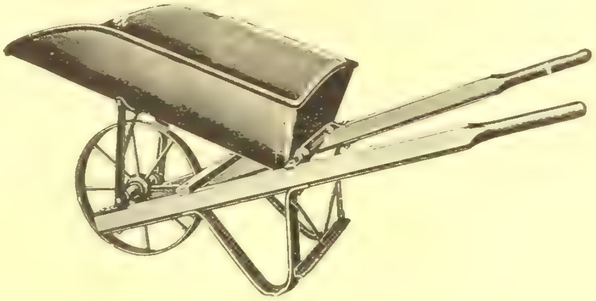

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Jacks, Wheelbarrows, Concrete Carts
Chain Blocks, etc., etc.

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Cobalt - Hunter Block.
Winnipeg - 259-261 Stanley St.
Vancouver - 614 Hastings St. W.

The Bar With the Brand is Your Protection

Bear in mind that the

"NF" Reinforcing Bar for Concrete Construction

is a BRANDED BAR.

Our trade mark is rolled in the bar every three feet.

The reason we brand our product is simply because we believe in it, and want to protect it in every way we can.

Inferior products are often **not** branded, and this will apply largely to reinforcing metals. The "NF" bar is protected by a brand because it is **worthy** of a brand. It is made of the very best material by the most careful process.

We not only make the BAR, but we make also the STEEL the bar is made from. We are the only Steel Company in Canada which MARKETS DIRECT its **own** type of bar made from its **own** steel.

Absolutely no re-rolled metal is used by US. This is not a knock at competition, as it is pretty well known in the building trades that many mills **do use** re-rolled metal.

Consider, then, only the brand "NF" on the bar when making up specifications, and you will be safe.

ONTARIO IRON & STEEL COMPANY, LIMITED
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Koehring Concrete Mixers

Steam, Motor or Gasoline Drive

Simple in Operation

Made in sizes to meet all requirements.

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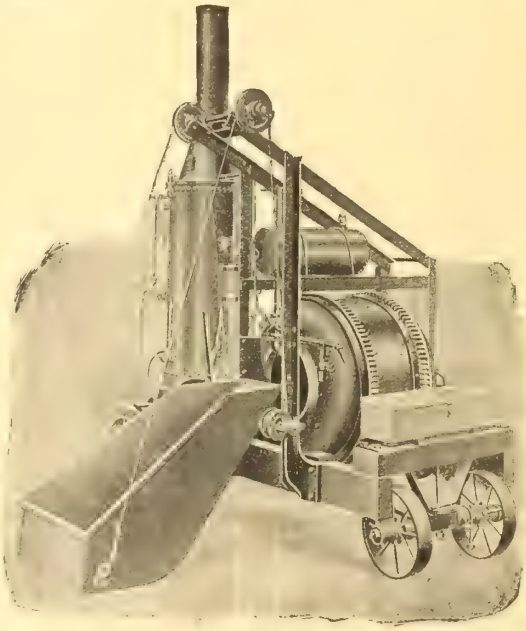

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Vol. 24 Toronto January 19, 1910 No. 3

Impressions from the Architects' Convention

The Ontario Association of Architects is to be congratulated upon the success which attended its 22nd annual convention held last week in Toronto. This event not only brought together some of the most earnest workers in the profession throughout the province, but also worked for an improved understanding between those engaged in the practice of architecture and those working in the allied fields of building and engineering. The harmonious relations established in this manner are, we venture to think, one of the most gratifying developments of such conventions as these. There is always a danger of confining one's efforts within too limited a sphere. A man may work conscientiously by himself and with application develop ideas and accomplish results of no mean order; but in most cases he will find guidance in the experience of others and certain advantages to be obtained by consulting with those who have a personal interest in his welfare. And as it is with the individual, so with the community. From the very nature of things the architect has much in common with the engineer, and these, in turn, with the builder and contractor.

*

Apropos of these reflections, it is noteworthy that the proposal now under consideration in Toronto to provide through the medium of a club a means for the more general co-operation of the various branches, is receiving the support of those most qualified to judge of its worth. In the course of his remarks at the annual banquet of the Association, Mr. A. W. Campbell, Deputy Minister of Public Works, came out strongly in favor of a movement instituted with the object of bringing technically trained men into closer fellowship while Mr. C. M. Canniff, president of the Engineers' Club of Toronto, referred to the commingling of architects and engineers in the Toronto quarters and traced a mutual disposition to "give and take" to this source. The connection between unity and strength has long been established. Isolation tends to the development of warped ideas, lack of appreciation of others and a general misunderstanding between those in whose best interests there should be a mutual desire to co-operate

*

It has been rather unkindly observed that the subject of obtaining greater facilities for architectural education is of a perennial nature. The Ontario architects, however, are to be commended for their work in this connection, and there is every indication that before many moons the profession will be rewarded for its persistent efforts. It would seem that the time is opportune for united action with a view to interesting the Provincial Government, university authorities and the public in this question. The plans of the Ontario Association are well considered and it is possible that a movement of this kind will develop in the near future. There is every ground for hoping that before very long Toronto University, at least, will be able to offer an architectural course that will be a credit to the profession in general and in particular to those who are giving their time and effort to the cause.

*

President Dinnis, of the Toronto Builders' Exchange, made some good points in his speech at the banquet, but revived a somewhat tired subject when he touched upon the advisability of architects signing their work The best recommendation that we have heard is that only important Government buildings, and structures of national importance, should bear a small tablet with the name of the designer. The greatest discrimination would be necessary, for it would savor too much of advertising methods if all sorts and conditions of buildings were labelled with the names and business addresses of their architects. Moreover, in some cases it might result in their obtaining fewer commissions. After all, a man is known by his works, and in most cases, if these are meritorious, he will make his reputation any way. In all probability Sir Christopher Wren did not give the matter a thought in connection with St. Paul's Cathedral. And he is not forgotten.

In proportion to its population, Canada is building more miles of railways than the United States. Canada's entire railroad mileage is now 233,000, which is one mile to every 300 inhabitants, as compared with one mile for each 381 inhabitants in the United States. In 1867, in all Canada there were just 2,278 miles of railroad track. There were constructed in 1909, and are under construction or contract, nearly twice as many miles of track as there were in Canada in 1868, or 4,327 miles.

A proposition has been made to amalgamate the City Engineer's and City Architect's departments at Toronto. Both City Engineer Rust and City Architect McCallum are opposed to this suggestion. The City Engineer says he cannot see any advantage to be gained by amalgamation Instead of cutting down the number of [illegible] departments he suggests that another one, an electrical department, be created, with an independent head. The City Architect says one objection to the proposed amalgamation is that the draughtsmen in one department do not understand the work of the draughtsmen in the other.

The New President of the Engineers' Club of Toronto

Mr. C. M. Canniff, who was recently elected president of the Engineers' Club of Toronto, is the eleventh to hold this position and is one of the oldest members of the institution. He was born at Belleville, Ont., on October 5th, 1866. In the following year the family moved to Toronto.

Mr. Canniff is one of the earlier graduates of the School of Practical Science—now merged in the Faculty of Applied Science of the University of Toronto—having completed his course in civil engineering in 1888. He is, in fact, the first S.P.S. man to sit in the president's chair. This may be taken as one more evidence of the influence of the institution with which Dean Galbraith and Dr. Ellis have so long been identified.

Mr. Canniff's first position was as assistant to the late Alan Macdougall, C.E., who was prominent in the organization of the Canadian Society of Civil Engineers. Later, he accompanied Mr. Macdougall to the City Hall, upon that gentleman's appointment as Assistant City Engineer for Toronto.

Upon the institution of the City Surveyor's office in 1899, Mr. Canniff succeeded to the position of chief assistant under the late Major Villiers Sankey, O.L.S., remaining until 1898, when he resigned to accept a post as engineer for the Expanded Metal & Fireproofing Company of Toronto, then just formed. Since that date he has been continuously identified with reinforced concrete construction. In 1908 he was appointed chief engineer of his company, the position he now holds.

Mr. C. M. Canniff, the 11th President of the Engineers' Club of Toronto.

With J. H. Chewett, B.A.Sc., C.E., in 1897, Mr Canniff collaborated in the authorship of the "Pocket Manual of Mining," which was well received.

The incoming president has long held among his fellow-members the reputation of a humorist. Screened behind the familiar signature of "E. C. Easy, C.E.," at various social club functions, he has contributed several witty papers upon technical subjects—which even the press could appreciate.

Mr. Canniff is a member of the Canadian Society of Civil Engineers, and a life member of the Engineering Society of the University of Toronto.

Another Hobby for "Good Roads" Campbell

The accompanying photograph is a good likeness of Mr. A. W. Campbell, Deputy Minister of Public Works for Ontario, who was elected chairman of the Toronto branch of the Canadian Society of Civil Engineers at the recent annual meeting of that body. Mr. Campbell's executive ability and the special hobby which he has made of good roads, have rendered him one of the most notable figures in the Provincial Government service. He was educated in the Collegiate Institute of Wardsville and St. Thomas. In 1886 he was licensed as a surveyor and engineer. From this date until 1891 he was engaged in the general practice of his profession at St Thomas, Ont. In the latter year he was appointed city engineer of St. Thomas, remaining at this post for a period of five years.

Mr. A. W. Campbell, the new Chairman of the Toronto Branch of the Canadian Society of Civil Engineers.

It would appear that the real discovery of "Good Roads Campbell" was made in 1896, for it was in this year that he was appointed Commissioner of Highways for the Ontario Government. Needless to say he fulfilled the duties of this office with distinction. In 1902 he was appointed Deputy Minister of Public Works for Ontario, the position he now holds. Mr. Campbell is popular, and his popularity is not confined within the precincts of the Parliament Buildings. He is intensely practical and businesslike, but at all times courteous and affable. He has a striking personality which no biographical sketch could describe. To get any adequate idea of the force of character of "Good Roads" Campbell, one must have some connection with his work and then talk with him about it.

The Ontario members of the Canadian Manufacturers' Association connected with industries pertaining to engineering are to be entertained at the 21st annual dinner of the Engineering Society at the Faculty of Applied Science of the University of Toronto, to be held on Wednesday, Jan. 18, in Convocation Hall Annex. It is interesting to note the growth of the Engineering Society since its organization. Prof. H. E. T. Haultain, C.E., was its first student president. It had then a membership of 36. Mr. W. D. Black, '09, the present president, reports an enrolment of over 600 members.

Programme for the Annual Convention of the Can. Soc. C. E.

The annual meeting for the election of officers and members of council for the year 1910, and for the transaction of business, will be held in the City Hall and in the Russell House, Ottawa, as follows :

Tuesday, 25th January

10 a.m.—Meeting in the council chamber, City Hall, for the nomination of scrutineers, receiving the report of council, reception and discussion of reports of committees, and general business of the society.

12 a.m.—His Worship, the Mayor, will welcome the society to Ottawa.

1.30 p.m.—Complimentary luncheon by the members of the Ottawa branch in the dining room of the Russell House.

3 p.m.—Continuation of business meeting for the discussion of reports, etc. It is expected that Sir Sandford Fleming and Mr. T. C. Keefer, C.M.G., past president of the society, will address this meeting.

8 p.m.—Meeting in the dining room of the Russell House. Address by the retiring president, Mr. G. A. Mountain, and other addresses.

Wednesday, 26th January

Members are invited to visit the following works and places of interest under the guidance of members of the Ottawa branch of the society. The several parties will leave the Russell House at 10 a.m. and in the afternoon at 2.30 p.m.; Ottawa Electric Power House; Mr. J. R. Booth's mills; E. B. Eddy Company mills; city waterworks; Chaudiere dam; Dominion Archives; Royal Mint; Observatory; Edinburgh mills.

8 p.m.—Members' dinner, Russell House dining room.

Thursday, 27th January

10 a.m.—Meeting in the City Hall, reception of reports of scrutineers and general business. If necessary an afternoon meeting will be held commencing at 3 p.m.

3 p.m.—(Or immediately on adjournment of the afternoon meeting of the society). Meeting of the newly elected council.

Tickets for the dinner (price $3) may be obtained from the secretary of the Ottawa branch, Mr. S. J. Chapleau.

The annual meeting button will be honored in all parts of the Parliament Buildings, and will secure free transportation on the Ottawa Street Railway lines.

The members of the Ottawa branch who will act as guides on Wednesday will wear buttons numbered from 1 to 10 inclusive.

By the kindness of the Grand Trunk, Canadian Pacific Intercolonial and other railways in the Eastern Passenger Association, members and their families who have paid full one way first-class fare going to the meeting in Ottawa will be returned free on presentation of a certificate signed by the ticket agent from whom the ticket has been procured at the point of commencement of the journey. The certificate is to be signed in Ottawa by the secretary of the society, and vised by a special agent of the Passenger Association who will be in attendance at the office of the secretary from 3 to 5 p.m. on Wednesday, Jan. 26th, and from 10 a.m. to 1 p.m. on Thursday, Jan. 27th. A fee of 25 cents will be charged by the Passenger Association in each case. Going tickets and standard convention certificates will be issued from 21st to 28th January inclusive, and properly validated certificates will be honored at Ottawa for the return journey up to and including 1st February.

C. H. McLeod, Secretary.

Hints on Sewer Construction in Freezing Weather

C. Chase, city engineer of Clinton, Ia., gives the following instructions to his assistants on municipal sewer work to be carried out in cold weather:

Use warm water and heated sand or gravel.

Use one pail of salt to each barrel of water in all mortar on pipe and brick sewers.

Use less water than ordinarily, and mix all mortars as dry as they can be effectively used.

Plaster only in the middle of the day and see that frost is out of the brick, and if not, take it out with water or steam jet; otherwise plaster will not stick.

Cover all joints in pipe work or masonry as fast as laid with dry earth or other material to protect from frost.

On a concrete sewer, for the bottoms use salt in water, heated gravel and only a small amount of water on cold days and tramp in place, and finish with top coat. Put such work in between hours of 10 a.m. to 12 noon, if possible.

As soon as laid, protect from weather by covering with manure or straw and placing canvas or tarpaulin over this; or when steam can be used, excellent results can be obtained by covering with tarpaulin about 18 inches above the works and turning in a small amount of steam. Do not turn on steam too strong, but just enough to keep warm. Empty bags over straw are also a help if tarpaulin is not handy.

Be sure all ice and dirt are removed before placing side walls on bottom or arch on walls, otherwise there will be no bond.

Keep stoves or salamanders going on inside of all concrete sewers.

Cold makes cement set slowly, and freezing and thawing of water in concrete before final set will ruin it.

It is much cheaper to thaw out ground with fire or steam than to pick frost.

Watch frozen banks for caving when frost goes out. It will drop all at once.

In back filling frozen ground allow 20 per cent. more shrinkage than when dry. (This does not apply to rock.)

Cover all work as fast as laid with unfrozen earth, if possible.

Back fill and clean up as close to work as possible before excavating materials freeze.

Tests for Sedimentation Tanks

Mr. A. F. McLachlin, city analyst of St. Thomas, Ont., acting under instructions from City Engineer Bell, recently made the test of the amount of purification effected by the use of the sedimentation tanks lately built, and the result shows 82 per cent. less organic nitrogen in the afflluent as it goes into the creek, compared to its entering the tanks. Other tests are to be made as to the percentage of solid matter taken out by the process, also as to whether the whole of the putrescible nitrogenous matter is removed. It is the intention of the city engineer to have continuous tests made so as to determine the necessary time that the sewage shall be held in the tanks to give the best results. Sewage varies so much in different cities that it is only by analysing the effluent that the best results can be determined.

The new Carnegie library building at Vancouver is practically completed.

22nd Annual Meeting of Ontario Architects

Successful Convention at Toronto—Gratifying Progress During 1909 — 23rd Annual Meeting to be Held Next September

The 22nd annual convention of the Ontario Association of Architects was held at the Association rooms, 96 King street west, Toronto, on Jan. 11th and 12th. The meeting was attended by a representative gathering. Those who signed the register were as follows: Percy E. Nobbs, Montreal; Geo. W. Gouinlock, Toronto; Wm. R. Gregg, Toronto; H. E. Moore, Toronto; Henry Sproatt, Toronto; Murray A. White, Toronto; T. Kennedy, Barrie; J. Francis Brown, Toronto; Geo. Angus, Toronto; E. L. Horwood, Ottawa; H. B. Gordon, Toronto; Edmund Burke, Toronto; C. H. Wright, Toronto; A. H. Gregg, Toronto; F. F. Saunders, Toronto; John Gemmell, Toronto; A. E. Nicholson, St. Catharines; W. L. Symons, Toronto; F. S. Baker, Toronto; W. F. Sparling, Toronto.

Tuesday, January 11th.

A meeting of council was held at one o'clock in the afternoon. The convention proper commenced at two o'clock. The president, Mr. Geo. W. Gouinlock, in his address dealt at some length with the general prosperity in the building line throughout the Province of Ontario during 1909. Reference was also made to the success of the exhibit of architectural drawings at the last National Exhibition, and to the fact that arrangements have been made for a loan exhibit next September from the Royal Institute of British Architects. Mr. Gouinlock's address will be found elsewhere in this report.

The report for 1909, submitted by the registrar, Mr. W. R. Gregg, contains the following items of interest:—

Membership—The membership of the Association is 87, of which 3 are honorary members, 49 regular members in Toronto, and 35 regular members in other places.

Council—The council has had nine meetings during the year, with an average attendance of six members

Students—Examinations were held in April, and supplemental in October, and 17 students came up, of which five passed the first, five passed the second, and one, Mr. W. D. Chown, passed the final examination, thus becoming a member of the association.

Six students, whose standing was satisfactory in all subjects except strength of materials, in the final examination, will be allowed a supplemental examination in this subject in April, 1910.

Guild Fund—No award has been made this year from the Guild Prize Fund, which now consists of $400 debenture and saving account balance of $77.88.

R.I.B.A. Examinations—Messrs. W. A. Langton and J. Francis Brown represented this association in the colonial examinations of the R.I.B.A., which took place in Toronto in November. F. S. Baker, F.R.I.B.A., is the secretary for these examinations for Canada.

Reports of both the registrar and treasurer were duly confirmed. The latter showed a balance in hand of $773.97. The receipts and expenditure during 1909 were about equal, so that the Association remains on practically the same financial basis.

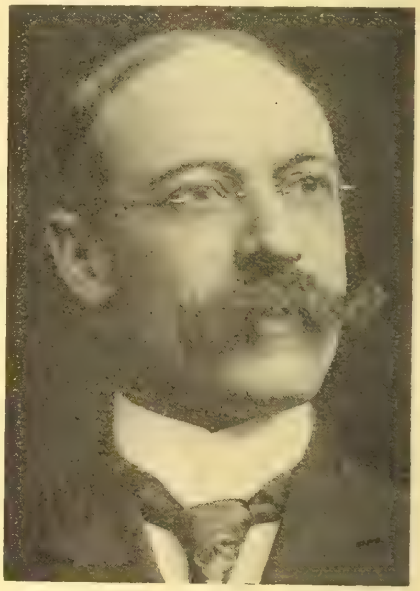
Reports of the standing committees and chapters were duly read and confirmed.

The educational committee reported regular classes on Monday and Wednesday evenings under the direction of Mr. Thomas Taylor. The present enrolment is 26. The committee entered a recommendation that at the earliest possible date the standard of entrance be raised to that of University matriculation.

After the report of the committee on affiliation with the R.I.A.C. had been received, it was moved and carried that the present special committee be reappointed for one year to carry on its work. The council of the association was authorized to take action upon the results achieved by this committee.

The reports submitted by the Ottawa and Toronto chapters indicated good progress during the past year.

In the course of the business proceedings of the day, the following resolution was passed: "The Association shall meet at such time and place as shall be decided upon by the members at the couniil meeting." Considerable discussion arose in connection with this decision. A by-law of the Association provided that the annual meeting should be held upon the first Tuesday after the 10th of January, and several of the members took exception to the new ruling on the ground that it was unconstitutional. A committee was appointed to report the following day upon the advisability of holding the next convention in September at the time of the exhibition of architectural drawings. The proceedings of the first day closed with a paper entitled, "The Architectural Profession from the Outside," by Mr. I. S. Macdonald.



Mr. A. Frank Wickson, Toronto, the New President of the Association.

Annual Banquet

The annual banquet, which was held at the National Club on the evening of Tuesday, Jan. 11, was not only an interesting and enjoyable function but an event of great importance in the proceedings of the convention, since it brought into fellowship with the architects those from other spheres of activity whose co-operation is at all times to be cultivated. Those present included:

G. W. Gouinlock, A. W. Campbell, C. H. Acton Bond, John Ewan, Professor Galbraith, W. R. Gregg,

H. B. Gordon, Professor C. H. C. Wright, Professor Nobbs, John A. Pearson, Arthur Dinnis, John M. Lyle, J. P. Hynes, F. R. Heakes (Prov. Govt. Archt.), W. L. Symons, A. H. Gregg, J. Gillies, E. Burke, C. M. Canniff, John Gemmell, Thos. Henry, Laurence Munro, J. A. Mackenzie, A. E. Nicholson, A. E. Watson, H. E. Moore, H. Sproatt, E. L. Horwood, Jules Wegman, J. C. Horwood, A. J. Stringer, Gordon West, L. Vanducer, and F. F. Saunders.

The toast to the King was proposed in fitting terms by the chairman, President Gouinlock, and responded to with much enthusiasm.

"Our Legislators" was proposed by Mr. W. Symons and replied to by Mr. A. W. Campbell ("Good Roads" Campbell), Deputy Minister of Public Works. Mr. Campbell expressed himself strongly in favor of the formation of an association that would bring the various parts into closer communion: the architects who designed the structures, the surveyors who laid out the streets, the engineers who planned municipal improvements, the landscape architect and all others of technical training concerned in the erection and making of a city. The speaker dealt at some length with the work of each and showed how essential it was to have some medium for bringing them all together. These different branches should work hand in hand. Mr. Campbell was of the opinion that the proposed Engineers' Club was a move in the right direction.

The toast, "Kindred Societies," was proposed by Mr. H. E. Moore and responded to by Messrs. C. M. Canniff, president of the Engineers' Club of Toronto; John Ewan, president of the Guild of Civic Art, and C. H. Acton Bond, president of the Toronto Society of Architects.

Mr. C. M. Canniff referred to the original notice sent out in February, 1899, calling a meeting at the School of Practical Science, and from which meeting the club sprang into existence This notice had been sent to "engineers, architects and surveyors." However successful the move to actually combine the three technical branches in one association, every one present was aware that since November, 1900, they had all been occupying the present King street quarters in perfect amity.

Results of this happy commingling had been that each body credited the other with an earnest desire to raise the level of its profession, and because by the nature of their work they were so closely related. There had always been a mutual disposition to give and take.

Meeting each other under the same roof, also, had served the agreeable purpose of permitting personal acquaintanceship, and the ordinary engineer "who didn't know an architrave from a lean-to, or a dado from a dodo," had found out that an architect was something else than a man who had at his finger ends all the big utilities and little vanities that go to make a house or a building fit to live in. The engineer had learned to know that the architect, like himself, was a human being and to fully appreciate his personal as well as his profesional worth. Mr. Caniff concluded with expressions of good-will and fraternal feeling.

The aims of the Guild of Civic Art furnished the chief point of interest in the remarks of Mr. John A. Ewan. It was hoped to educate the people of Toronto to the knowledge that the city could yet be made far more beautiful without any necessarily heavy expenditure. The speech was enlivened by touches of characteristic humor and was particularly well received.

Mr. Acton Bond expressed in appropriate terms the good feeling felt for the Association by the Toronto Society.

"Our Guests" was proposed by Professor C. H. C. Wright, Toronto University, and responded to by Professor Nobbs, of McGill University, Dean Galbraith, of the Faculty of Applied Science; Messrs. John Lyle, E. L. Horwood, of Ottawa, and Arthur Dinnis, president of the Toronto Boilders' Exchange.

After touching briefly upon the subject of architectural education, Prof. Nobbs spoke of the need for educating the public in regard to the architect and his work. The public must first be brought to regard architecture as being upon the same plane as the other professions. The first lessons to be learned were that architects must be treated properly and paid adequately. The speaker alluded to the strong position of the Quebec Association, which holds a charter empowering it to restrain anyone from practising without permission from the Association.

An interesting address was that given by Mr. John M. Lyle. The speaker referred to a recent speech of Sir Wilfrid Laurier, who advocated greater attention to the work of beautifying our cities. Mr. Lyle contended that Toronto was badly laid out, citing the approach to the City Hall as an outstanding example. The speaker thought that Sir Wilfrid Laurier might use his influence to have the new cities of the Dominion planned by architects instead of engineers. The best cities of Europe and America had been laid out by the architectural profession, and this precedent should be followed by the Dominion. Mr. Lyle spoke in glowing terms of the useful work of Professor Wright at Toronto University.

Professor C. H. C. Wright, of Toronto University
who was elected 1st Vice-President.

The representative of the Ottawa chapter, Mr. Horwood, made a humorous speech which was well received. Mr Horwood spoke of the work and progress of the Ottawa community.

Dean Galbraith, who was accorded an enthusiastic reception, referred to his long connection with the Association and expressed himself as being entirely in sympathy with its aims. The speaker declared that conventions such as this were particularly useful as a means of rubbing down the asperities that are bound to arise in all spheres of endeavor. The Dean said that he considered the annual banquet about the most important item of the convention. One could read about the business end of the work in the papers but one could not so obtain the pleasure that was to be derived at such a function as this. The speaker concluded by complimenting Prof. Nobbs upon his excellent work at McGill University.

Mr. A. Dinnis, president of the Toronto Builders' Exchange, said that he did not altogether share the general impression that architects are inclined to hold aloof from the builders. He hoped for a happier and better intercourse in the future between the two interests. They had much in common, and much might be accomplished if they met together to discuss subjects of mutual concern, such as the form of contracts, taking of tenders, and so on. Referring to the Builders' Exchange, Mr. Dinnis emphatically denied that the primary object of this institution was to afford its members facilities for meeting together to arrange prices. Probably the best work of the Exchange had been accomplished in checking the unreasonable demands of labor. At present, strong opposition was bein gmade to the Lien Act and Workmen's Compensation Act. Under these measures both the contractor and owner would be called upon to bear the most onerous burdens and risks. Mr. Dinnis expressed himself as being in favor of having tablets on the most important buildings, bearing the names of their designers, and adduced several arguments and precedents in favor of this end.

Wednesday January 12th.

There was a good atendance on the second day, when a decision was reached affecting several matters of interest.

At the morning session, which was devoted to the business of the convention, it was decided to hold the next annual meeting in September, at a date to be decided later by the council of the Association. The statistical and business year will end on July 31st.

Considerable discussion developed in connection with the following motion: "Resolved that the council of 1910 be instructed to procure, if possible, from the Ontario Legislature, amendments to the Act respecting the Profession of Architects, eliminating the title 'Registered Architect,' and substituting for it 'Member of the Ontario Association of Architects,' and eliminating the title 'Registrar,' and substituting for it 'Secretary.'

At first this resolution was passed, but owing to the feeling of the Ottawa chapter it was subsequently re-opened. The arrangement reached finally was that the council should take a plebiscite of the members of the Association throughout the province.

Mr. Sproatt presented a report compiled by three members each of the Association and of the Toronto Society of Architects, in which it was recommended that the University be asked to provide better facilities for architectural education. A curriculum was suggested. This report was adopted in practically the form submitted and the committee empowered to continue its work.

A recommendation was passed that members of the Association receive only students who have attained the matriculation standard.

An interesting discussion ensued in connection with the subject of education. The general feeling of the convention was with Prof. Nobbs, of McGill University, who contended that a graduate of the Faculty of Architecture should not be turned loose upon the public upon the expiration of his course, but be compelled to serve two or three years in an architect's office.

The next item on the agenda was an exceptionally interesting paper, entitled "Architectural Education in Canada," read by Prof. Nobbs. This paper will be published in the next issue of the "Contract Record." Afterwards, an interesting paper, entitled, "Architecture and its Relation to Art," was read by Mr. John M. Lyle, Toronto. (See another column).

The election of new members of council resulted in favor of Mr. A. E. Nicholson, St. Catharines, Ont.; Mr. Jules F. Wegman and Professor C. H. C. Wright, Toronto. The other members of the council are Messrs. H. Sproatt, J. F. Brown, M. A. White, J. A. Ewart, G. Helliwell and A. Frank Wickson. The new council at once held a meeting and elected the following officers: President, Mr. A. Frank Wickson; First Vice-President, Professor C. H. C. Wright; Second Vice-President, Mr. Henry Sproatt; Treasurer, Mr. Grant Helliwell.

General regret was expressed when the registrar, Mr. W. R. Gregg, who has rendeerd most efficient service in this capacity for ten years, announced his resignation to the council. At the time of going to press no election had been made.

PRESIDENT'S ADDRESS

By Mr. Geo. W. Gouinlock, at the opening session on Tuesday January 11th.

It is my privilege to voice the welcome which the council and Toronto members of the Ontario Association of Architects cordially extend to the members generally at this, the 22nd annual convention of the Association.

These meetings give us almost the only opportunities we are acorded of coming into personal relations with any but our local members, and the yearly communion with our professional brethren from other cities and localities must tend to widen our horizon, broaden our sympathies, and deepen gent appreciation of, and desire for, the less material but to speak.

We may congratulate ourselves upon the unusually prosperous year in building operations which has just closed (the most successful in the history of architecture in Ontario), and we can look, I believe, with cheerful confidence to a continuance of that prosperity during the present year, and, we hope, for many successive years.

Our country is developing with astounding rapidity its material resources, is extending its manufacturing and commercial interests day by day—but, best of all, an intelligent appreciation of, and desire for, the les smaterial but none the less essential, facets of our complex civilization is steadily growing, the beautiful, the graceful, the true—and while buildings are demanded that shall fit defined uses of unending variety, it is required with more and more insistence that they shall also adorn the localities in which they are erected—that while a building shall be built to last, it shall also be the poet's definition of durability, "a thing of beauty."

But while we of the present generation of architects may be justly proud in our modest way, of our own efforts in the noble art we profess, we are not unmindful of the limitation which circumstances have placed upon our powers, and we have sufficient disinterested regard for the profession to desire the removal of some, at least, of these disabilities from the path of our successors.

In various ways we have endeavored to afford our students means of improving their knowledge and of broadening their outlook, by holding classes of instruction in planning, designing and construction, offering prizes and conducting examinations.

Last year an exhibit of architectural drawings and designs was held at the Canadian National Exhibition, which proved distinctly interesting and educative. Arrangements have been made for a loan exhibit from the Royal Institute of British Architects at the Canadian National Exhibition in September of this year. The large room in the Applied Arts Building will be used exclusively for this exhibit, which we hope will include numerous examples from our Canadian architects. On this account the council decided to have no exhibit at this convention. We hope to have each year some exhibit of the kind at the Canadian National Exhibition, which cannot fail to have a distinctly educative effect upon all of us, but especially upon the more impressionable minds of the students.

The question of higher education for our students has been very earnestly discussed among us, and the Ontario Government has been asked to assist us in establishing a certain standard to which it shall be necessary for persons to attain before entering upon thestudy of architecture as a profession. The safety of the public demands trustworthy and scientific building construction in all its varied ramifications. Its requirements and moral fell-being necessitate well planned and tastefully designed buildings. But the profession should further ask a degree of culture and general knowledge, a sense of honor, a regard for ethics that would seem to be best secured by a university education.

To attain this we should require that the student should enter an architectural course at a university before obtaining admittance to the office of any member of this association.

It is to be regretted that up to the present the University of Toronto has been unable to see its way to establishing a chair of architecture, for such a chair, combined with a course in arts, would undoubtedly promote the best interests of our profession.

There is a joint committee of our Association and the Toronto Society of Architects, appointed to formulate a scheme for the higher education of architectural students, and you will no doubt receive a report from that committee during this meeting.

There have been various charges made with regard to the safety of Toronto Public School buildings, and while we have appreciated as a body of architects for some time the fact that Toronto school buildings, in the matter of architectural design, have been inferior to almost every other type or class of buildings it is customary to erect in Toronto, the question of safety of the school children is one which has never been widely discussed by us as an architectural body. We owe it to ourselves as well as the public at large to make an investigation into just what protection is really afforded the children in our schools, and a committee of our Association has been appointed with this object in view.

In October last we had the pleasure of granting the use of our rooms to the Royal Institute of Canada, in which to hold their second annual assembly, the Toronto chapter of our Association inviting the assembly to lunch both days of their meeting. A committee of our Association was apponited to confer with the Royal Institute to discuss the subject of affiliating with the latter body. A report from that committee will be submitted to you during this meeting.

I am proud to say that our Association is progressing splendidly and will eventually, I am sure, succeed in attaining its main object, that is, the elevation of the profession to the plane which it properly deserves, by the educating of the student and the awakening of public interest.

I regret that the members of our Association in the cities of Hamilton and London have not yet formed local chapters, for I feel certain such chapters do promote the best of good feeling and fellowship among their members, as well as strengthen the Association as a whole.

I feel that the past year has developed an excellent spirit among the members of our profession, no doubt due partly to the social intercourse we enjoy through the local chapter.

In conclusion, gentlemen, I must thank you again for the honor you did me in electing me your president for the past year. The members of the council have been very assiduous in their attention to the duties devolving upon them, and have given fully of their time and thought to the Association's welfare.

ARCHITECTURE AND ITS RELATION TO ART

Read by Mr. John M. Lyle, on Wednesday, January 12th

The title of this paper is somewhat misleading, for architecture is a fine art—the greatest of all, a combination of many arts.

The first question that naturally arises in one's mind is, What is architecture? There are many definitions to be found in the different text books available, but none of them quite explain the complex combination that is called to mind by the word "architecture." "Architecture is the art of expressing in concrete form the structural needs and decorative ideals of man."

The late M. Paul Blondel, one of France's most distinguished architects, in speaking of architecture described her as a jealous mistress, who yielded her favors but rarely, and then only after the most earnest and persistent endeavors on the part of her devotees—the architects.

As I am addressing a meeting of architects, it occurred to me that it might be more profitable to us all, if we were to consider not only architecture as an art—a study necessarily in the abstract—but architecture, the art, which concerns us in our daily practice.

In Canada, we find a deplorable ignorance as to what architecture is; a deplorable lack of consideration for the architect; a deplorable lack of taste. In short, we have to contend with the ideals of a new country, absorbed in the development of its industrial resources, and not at yet ready to listen to the importuning of Venus.

It is our duty as architects to educate public opinion to a better understanding of what architecture really is. We ought to have a chair of architecture in every university in Canada, where architecture could be studied as a fine art.

We ought to urge upon the Government the necessity of having our new cities—and our old ones, too—planned and re-planned by architects and not by engineers. In my humble opinion, engineers have been the curse of Canadian and American city planning. Their laying out of our streets, avenues and squares has been stupid in the extreme, and without any consideration of the æsthetic side or of the practical. The plans of our cities are almost criminal in their stupidity, and, worst of all, is the fact that the engineers are still "on the job."

We ought to arrange lectures, illustrated with lantern slides, which would stimulate public interest in the study of architecture as a fine art. For instance, there are many men and women now taking an interest in furniture, and in decoration, as applied to the home. A series of lectures could be arranged covering the different styles of interior decoration. Once create an interest in the decorative side of architecture, and you have the kernel of a growth, that in its ramifications opens up unlimited possibilities.

We ought, by our example in the office, to inspire our draughtsmen, the contractors and our clients with the idea that there is more in architecture than the mere erection of a structure to shelter their heads, and to give them the necessary accommodation for their daily wants. Then the mason, the bricklayer, the carpenter, the plasterer, all should be encouraged to live up to the highest possible standard of excellence in their work.

I am quite aware that it is absolutely impossible in modern practice to obtain ideal conditions in the execution of work in Canada. On the other hand, it is certainly our duty as architects to raise the standard of excellence by every legitimate means in our power. If I might be allowed to suggest one method of raising the standard along certain lines, it would be that the architect spend more time in studying his drawings, and also in making more complete details and full size details for the contractor's use. Compared with the best French and American practice with which I am familiar, I might say that there is no comparison in the number of drawings and attention paid to studying of details in the practice of these countries and that of Canada.

We must introduce "quantity surveying" into Canadian architectural life. We often find that there is the greatest variance in prices submitted by different contractors. Time and again we are obliged to accept the lowest tender, with the result that the contractor finds out, possibly, that he has made a mistake in his quantities; consequently he is forced either to accept a loss, or to skimp his work in order to come out even. Would it not be much better to have the English idea of quantity surveying adopted in this country? It seems to me that the introduction of this system would materially aid in uplifting architecture "as a fine art."

We ought to educate the public to the fact that it is necessary to have plenty of time for the erection of our buildings, and that speed is not the only consideration. Structures are run up here or "slapped" up at break-neck speed—the result being that woodwork is put on top of wet plaster, and everything is rushed forward pell-mell. How often we hear people say that the only way to get workmen out of a house is to move in! Would it not be well for the architects to explain to their clients the great necessity in building operations of making haste slowly? We certainly can do some missionary work along these lines to the decided advantage of architecture as a fine art.

Surely we architects have in Canada to-day great responsibilities and great opportunities. It rests very largely with ourselves what the architecture of the future in Canada is to be. Let us unite in trying to further the study of architecture as a fine art; let us by our efforts aim to uplift the architectural ideals of to-day. Surely such ambition is worthy of our united efforts from a purely patriotic point of view—aside entirely from any actual benefits that may accrue to us individually. It seems to me that at this stage of Canada's development we are, more or less, pioneers in our own particular field. In the past there have not been many trained architects in Canada. The unlimited wealth and the great buildings which are sure to be erected in the future ought to inspire us to more determined efforts to upbuild our profession, and to place Architecture where she belongs—at the head of all the arts.

Proportion of Rooms

Speaking on the subject of proportion of rooms, with reference to their sanitary features, a modern writer says: "For purposes of ventilation the height must bear some relation to the size. Adequate movement in the currents of air cannot be secured in a room unless the height be proportioned to the width and length. The minimum height must be fixed with reference to that which will allow the currents of air to circulate without being inconvenient to the occupants. Therefore, in proportion as the width and length of a room are increased so must the height be increased. On this account it is not advisable to make rooms much less than 10 feet high. With large rooms, as the height should be increased in proportion to the size, if the cubic space be the measure of the number of occupants, the area of floor space per occupant would diminish with the size of the room. As, therefore, the height of rooms is necessarily variable, it follows that it is rather the floor space which must be considered in allotting accommodation to the occupants of a room than the cubic space. In barracks, a floor space of from 50 to 60, and occasionally 80, square feet is allowed per occupant. These are for rooms occupied by day as well as for sleeping-rooms. In workhouses, for dormitories, a minimum floor space of 25 square feet has been admitted, provided the ventilation was carefully attended to. In nurseries and servants' rooms, from 50 to 60 square feet are desirable per occupant—that is to say, a room 10 feet square, or 10 feet by 12 feet in area, should not contain more than two persons. In school rooms which are only occupied during parts of a day, and where the air can be changed between the periods of occupation, a less amount would suffice, and from 15 to 20 square feet are sufficient."

The Last Word in Elevators

The Parkin Elevator Company, Limited, of Hespeler, Ont., are to be congratulated upon the result of a test which was recently made in connection with one of their high speed direct connected electric passenger elevators installed in the new building of F. J. Castle Company, Limited, wholesale grocers, Ottawa. This test was made in the presence of Messrs. Chamberlin & Gardiner and their expert, one of the leading electricians of Ottawa. The various safety devices with which this installation is equipped were shown to be perfectly capable of providing adequate protection in case of accident. Automatic limit stops and slack cable devices worked with perfect satisfaction, as did also the speed governor and compression safety device. The car was brought to an easy and complete stop in about a six-foot drop, the current being disconnected and the winding gear stopped. Within a period of 90 seconds the safety was released, power connected and the car again in operation. Mr. L. B. Fradenburgh, one of the company's experts, was in charge of this installation. Mr. D. J. MacKenzie, secretary of the Builders' Exchange at Ottawa, is local agent for that city.

News and Notes

City Engineer Rusts reports that a profit of $100,000 has been made during the past three years by laying pavements on the local improvement plan.

Prof. Haultain gave an interesting address last week before the Engineers' Club of Toronto, on "The Relationship of the Mining to the Civil Engineer." President Canniff was in the chair.

Mr. J. Chalmers, Provincial Government Engineer for Alberta, will read a paper entitled "Steel Railway and Highway Bridges of Alberta," before the Engineering Society of Edmonton on Jan. 20th.

The Ottawa Builders' Exchange held an enjoyable euchre contest and smoker in their rooms at 201 Sparks street last week. The attendance numbered about 40. Mr. H. Robillard and Mr. D. J. Driscoll were the prize winners.

The following officers were elected at the annual meeting of the Toronto branch of the Canadian Society of Civil Engineers: Chairman, Mr. A. W. Campbell, Deputy Minister of Public Works, Ontario; Secretary-Treasurer, Mr. Peter Gillespie, lecturer in applied science, Toronto University; Councillors, Mr. T. S. Scott, assistant city engineer, Mr. T. C. Irving, Jr., Mr. O. W. Smith, Mr. N. H. McLeod, and Mr. A. W. Connor.

Mr. M. J. Butler, Deputy Minister and Chief Engineer of the Department of Railways and Canals, has resigned in order to become general manager and 2nd vice-presiednt of the Dominion Iron & Steel, and Dominion Coal Companies. It is understood that Mr. Butler's present salary of $8,000 a year will be more than trebled in the new position. Mr. Butler's technical training as an engineer and his executive ability have enabled him to fulfil his various duties with distincton, and the loss will be a serious one for the Government.

Methods and Cost of Concrete Sewer Work

Relative Merits of Monolithic and Concrete Pipe--Former generally cheaper, latter advantageous in special cases cited herein

By Fred R. Charles, City Engineer, Richmond, Ind.*

For the past three years we have been using concrete to a large extent in sewer work. Our experience includes the use of concrete pipe, non-reinforced and reinforced both with rods and bands, and with expanded metal, and of monolithic sewers, built in trenches of different natures, rock, earth, quick sand, running water, etc., and employing various methods of reinforcement, such as plain, twisted, and lug bars, expanded metal, and Kahn rib metal.

Our reason for adopting concrete so largely is the fact that vitrified pipe, of course, is not made in such large sizes, and the cost of the largest sizes made is almost prohibitive, and that sewer brick is expensive here, and bricklayers who can do sewer work are scarce and high-priced. We have excellent material for concrete right at hand, which costs 75 to 80 cents per cubic yard delivered on the ground, while cement costs $1.25 to $1.55 per barrel, so we are enabled to obtain excellent results much cheaper than with brick or vitrified pipe, after we get above 24 inches diameter. Below that size, vitrified pipe is preferable with us.

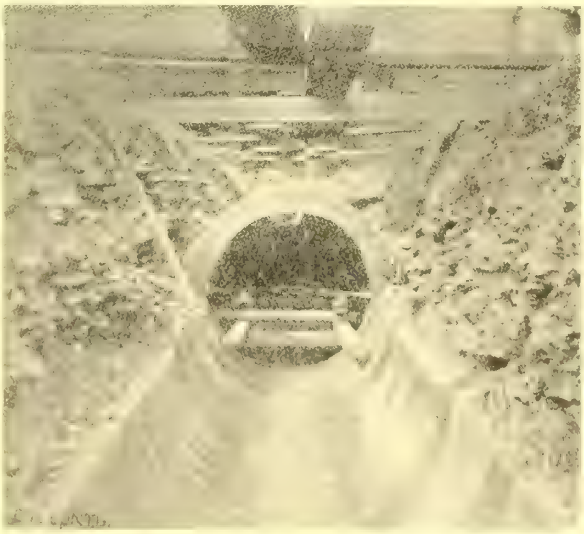
Our first concrete job was with reinforced concrete pipe, 36 inches, 30 inches, and 24 inches, in diameter, and reinforced according to the practice of the company at that time with longitudinal strips and circumferential bands of iron It cost our contractor delivered, per lineal foot, 24 inches, $1.10; 30 inches, $1.90; 36 inches, $2.30.

Right here I want to emphasize the fact, that in order to secure good results in sewer work, even more care than in other concrete work must be exercised in all the processes. Good aggregate material must be secured; good cement and enough of it must be used; mixing and placing well and thoroughly done, and all details carefully superintended. But this, our first job, still appears alright, although in a street with only 2 to 3 feet cover in places, and has sustained the passing and repassing of a street roller, weighing 18 tons, in macadamizing the roadwaay. Shell thickness of this pipe is for 24 inches diameter, 2½ inches; 30 inches diameter, 3½ inches; 36 inches diameter, 4 inches.

The next season we built several miles, employing both concrete pipe and monolithic construction, in sizes 54 inches, 48 inches, 42 inches, 36 inches, 30 inches, 24 inches, and 20 inches. The 20 inch pipe was not reinforced, and our experience was not satisfactory; however, in my opinion, owing largely to carelessness in making and seasoning, which was done in the heat of summer without affording protection from the sun, or sufficient sprinkling. But in that size I would prefer a vitrified pipe to a nonreinforced concrete.

Forty-two-inch was the largest size we used in concrete pipe. This was made according to the "Sheets" system, in which expanded metal is used for reinforcement; thickness of shell is 11/12 inches per foot diameter; 24-inch pipe made in 2½-foot, and larger sizes in 3 foot lengths. Pipe is made in a mold consisting of an outer steel casing and an inner collapsible shell. The pipe rests on the end upon a pallet, and each end is formed by a shaping ring, so that it is notched or rabbeted through half the thickness of the shell, on the outside for one half the circumference. The pipes are laid so as to form a groove at the joint, coming on the interior for the lower half and on the interior of the upper half, whereby the motar is always plastered downward in cementing the joint. For handling and placing in the trench a tripod or beam derrick is needed with a block and tackle or chain hoist, as the weight is considerable. Our average cost to lay these pipes, including plastering the joints, was for 42 inches, $0.083; 30 inches, $0.06; 24 inches, $0.053 per lineal foot.

Our first monolithic work was on a sewer 48 inches in diameter, all in rock and about 18 feet deep. Being new in the business, the design was probably stronger than necessary. Thickness of shell is 6 inches, reinforced with ½ inch longitudinal and cercumferential rods, the latter being in two portions, bent to the required radius, and long enough to give a good lap at the spring line. The trench was first shaped to the outside of the sewer, allowing proper thickness for the shell Then the concrete for the flow line was laid, in a strip about 2 feet wide, between rails as in sidewalk work, the proper radius being given by a straight edge drawn over templets. In the side rail notches were cut the required distance apart to hold the circumferential rings, to which latter the longitudinal rods were fastened by wiring.



View of Monolithic Concrete Sewer.

We used plain rods, twisted rods and lug bars. Our experience showed that the lug bars were the best of the three, as they were easier maintained in position. But this method of reinforcement, although affording ample strength, was tedious to place and hard to keep placed, and after thoroughly trying it, a change was made to expanded metal, which speedily proved itself

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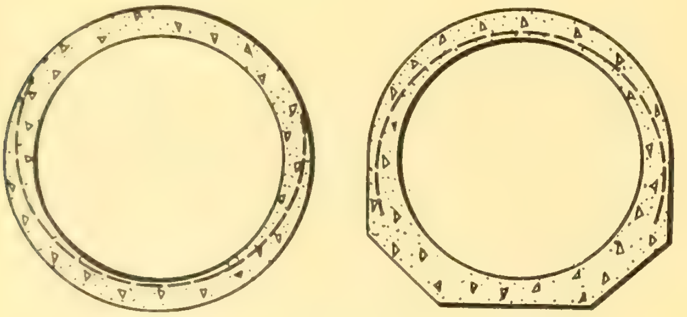
In Engineering-Contracting.

much superior in these respects. This was made in two sheets, one 3 inches mesh, No. 10 standard for the lower half of the sewer, and the other 3-inch mesh, No. 10, plus 50 per cent., for the upper half, both bent to the required radius, and long enough to afford plenty of lap at the spring line. For this portion, collapsible semicircular forms were used. The method of operation was as follows: The trench having been shaped as nearly as possible to fit the outside of the sewer barrel, the concrete flow line was placed ,without using any side rails, and brought up to two inches below the grade line; then the sheet of expanded metal placed thereon, and the concrete brought up to the grade line, the proper shape and grade being given by cutting off with a straight edge, resting on heavy blocks, cut to the required radius and placed about 16 feet apart, or the length of a convenient straight edge. After the concrete had set sufficiently, usually the next day, the lower semicircular form was pulled ahead onto the next section of flow the spring line, and the walls of the trench forming the outside casing of the concrete. When this was set, the the form was pulled ahead onto the next section of flow line, and the upper forms placed; the sheet of reinforcing metal bent to the right radius, and put around the form, being kept two inches inside the concrete by a piece of brick two inches thick, resting on the form. These forms were five feet long and were coupled ten together, making 50 feet in length. After the work had progressed enough so that things became systematized, the usual schedule for the day was as follows: (1) Releasing forms from the invert constructed the day before and placing them on the flow line laid the day before; (2) releasing arch forms and pulling ahead on to the invert; (3) concreting the arch; (4) concreting the invert in the section ahead; (5) concreting 50 feet of flow line ahead for the next day. On another sewer, 40 inches and 42 inches in diameter, full circle forms were employed. The full circle type possesses the advantage of being moved with fewer operations, and the concrete can be filled all round the circumference to the flow line at one time.


Sections showing forms of reinforcement on solid bottoms.

Another sewer, 54 inches in diameter, was built in horse-shoe shape, semi-circular arch, vertical sides and bottom slightly V shaped. It was in an open ditch or water course, so nearly all except the flow line was above ground, and outside forms were necessary, in concrete. First the bottom was laid as in sidewalks and the vertical sides, run up to the spring line with ordinary plank inner and outer forms, the expanded metal reinforcement having been bent and placed as before, with plenty of lap at the spring line. The arch was put on with a semi-circular form. On these monolithic jobs the average labor hours per lineal foot for the different operations for constructing the sewer, using "Blaw" forms and expanded metal, reinforcement is given in the following table. Knowing the wages paid labor per hour and the price of materials, this will be some guide to the cost in other places:

	Labor hours per lin. ft.
Placing flow line	0.48
Setting invert forms	0.50
Concreting invert	0.44
Setting arch forms	0.33
Concreting arch	0.25

This past season we have just completed another system, using 54 inch, 48 inch, 42 inch and 36 inch concrete and vitrified pipe for smaller sizes. Profiting by our past experience, we made some changes in the design. It was considered that the thickness of the shell might safely be reduced, and that the bottom reinforcement was not necessary in trenches with solid foundation. Kahn rib metal was employed for reinforcing and gave good satisfaction. It is easier to handle than expanded metal, and owing to the shape and size of the spaces between the ribs, sufficient room is given to put in a stick or tamp to settle or jostle the concrete around the forms, which is very important in order to avoid air spaces and force the cement to the surface to make a smooth and tight job. For 54-inch sewer the sheet of metal is 10 feet long, 45 inches wide, No. 5 gauge, bent to the required radius at the mill. To hold the metal in proper position strips of wood were inserted between it and the form, and withdrawn as the concrete was deposited. Forms for this work were the "special centres," 6 feet long, and 6 sections were used, which make 35 feet of sewer, allowing for the necessary lap. These forms are especially well adapted to large sewer work, owing to the accessibility of all the parts, which renders them easy and inexpensive to handle. They are made of sheet steel with steel ribs on the inside at each end. These ribs are collapsed by especially made "collapsers"; forms then set in place, with the gauge wire, which gives the required circumference, on the outside of the forms, then the "collapsers" are released, permitting the ribs to spring out; then rods with turnbuckles inserted and turned until the gauge wire is tight. The time to move and set up the forms was naturally reduced with practice; at first it took about 13 labor hours, four men working 3¼ hours. Later, becoming more expert, they did it in 2½ hours. This includes release of forms, moving to the section ahead, anchoring, and placing of reinforcement ready for concrete, providing for 35 feet of sewer. The ordinary programme for a day's work was as follows: (1) Releasing and setting up forms on the flow line prepared the preceding day, which, as shown above, took till about 9 o'clock; (2) concreting the circle, which was usually finished by noon or shortly after, when machine mixed; (3) concreting the flow line ahead for the next day's work, taking about half an hour. Both hand and machine mixing were tried. The former required seven men, excluding superintendence, and for 35 feet of 54-inch sewer about 50 labor hours sufficed. The mixing boards were right alongside the trench, and concrete shovelled directly to place. In machine mixing, although more men were required at one time, the total of labor hours was less, amounting to an average of 40, against 50 for the hand method, and also saving superintendence for that time. Ordinarily, 12 men composed the gang, including four or five wheelers, three or four shovellers, one to help dump wheel barrows, one to remove spacing sticks from reinforcement and retain it in position, and one to receive the concrete, tamp or jostle it to place, and spread it to approximate thickness over the arch, and lastly a finisher who scrapes down the high spots and fills up the low ones, and finally smoothes over the surface with the back of a flat, square pointed shovel, thus filling all voids and giving a very good looking appearance. This man becomes very expert in gauging the proper thickness. For the lower half of the sewer the concrete should be very wet, so that it will flow freely around and under the forms; for the arch not so much water must be used; only enough to show quite perceptibly when concrete is tamped, as the concrete must have sufficient consistency to retain its position and not run off the arch; for the flow line the proper consistency is between the two. At first, house connections were provided for by building in ordinary vitrified slants or thimbles, but the flanges of these were frequently broken by falling rock and otherwise, so a change was made and an opening left in the concrete shell by means of a special form or core, devised by the inspector on the work. This comprised two circular blocks of hardwood, nailed together; one eight inches in diameter and two inches thick, the other six inches in diameter and three inches thick. Inserted in the concrete this left a good flange to receive the end of the 6-inch house connection pipe, and was extremely inexpensive, two of these blocks lasting for the whole season. The average cost of this work was as follows:

For 54-inch sewer, 5-inch shell, rib metal 10 feet:

	Per. lin. ft.
Cement, 0.347 bbl at $1.25	$0.434
Gravel at $0.80	0.260
Rib metal	0.30
Forms (cost of)	0.125
Labor, 20 cents per hour	0.230
Total cost, exclusive of machine and superintendence	$1.349

For 48-inch sewer, 5-inch shell, rib metal 9 feet:

Cement, 0.29 bbl. at $1.25	$0.362
Gravel at $0.80	0.170
Rib metal	0.25
Forms	0.115
Labor, 20 cents per hour	0.186
Total cost, exclusive of machine and superintendence	$1.083

For 42-inch sewer, 4-inch shell, rib metal 8 feet:

Cement, 0.20 bbl. at $1.25	$0.25
Gravel at $0.80	0.118
Rib metal	0.24
Forms	0.115
Labor at 20 cents per hour	0.188
Total cost, exclusive of machine and superintendence	$0.911

All these different procedures have given an excellent opportunity of judging the relative merits of monolithic and concrete pipe. In ordinary cases the monolithic is undoubtedly the cheaper, and in workmanship and durability can be made first class. Probably it can be made more nearly water tight than the joints of the pipe. Tamping under the lower quarters of the pipe is necessary, but is difficult to do, and evidently can not be as solid as the monolithic with the concrete built right against the bank. Monolithic requires a less width of trench, as the cutting is made the exact dimension, while the pipe needs a ditch several inches wider, in order to enable the tamping to be done under and around . On the other hand, the monolithic requires the laying of a subdrain tile to carry the water and smooth the work. This was done on all our sewers. An ordinary -inch soft drain tile laid in the bottom of the trench carried the water away without any trouble, in most cases, and abundantly justified its cost. But when exceedingly treacherous soil is encountered or if it is necessary to do the backfilling immediately, the concrete pipe would be the more advantageous. Also the latter can be made on the bank or elsewhere in more favorable conditions and under better and more careful superintendence, whereby better work could be obtained. There is doubtless a field of usefulness for both methods, and the local conditions must determine the better.

Alderman Pocock of London, Ont.

The electors of the Forest City made a wise choice when they conferred aldermanic honors upon Mr. Henry Pocock, president and manager of the London Concrete Machinery Company, London, Ont. This gentleman has marked ability and a reputation for thoroughness, a particularly desirable quality in one concerned with civic administration; moreover, the experience gained in the tenure of such a responsible business charge as his is a valuable asset in the work of an alderman. Mr. Pocock is well posted in both the practical and theoretical ends of the business with which he is connected, which is expanding rapidly under his supervision. Of the new committees which have been formed, Mr. Pocock has been appointed to the Board of Works, Western Fair Board and Manufacturer's and Reception Committees.

Mr. Henry Pocock, President of the London Concrete Machinery Company, Limited, who was recently elected to serve on the aldermanic board at London, Ont.

At the annual meeting of the Montreal Builders' Exchange, held last week, the following officers were elected for the current year: President, J. N. Arcand (re-elected); Vice-President, James Ballantyne; Directors, carpenters, F. Pauze; general contractor, E. G. N Cape, lumber and mill supplies, Wm. Rutherford; granite and marble, Jos. Brunet; reinforced concrete and cement, A. D. Church; master painters, W. T. Castle; master plumbers, J. W. Hughes; master roofers, Thos. Gilday; electrical supplies, E. W. Sayer; contractors' supplies, Alex. Bremner; stone and cement, T. A. Morrison.

Home of Excellence in Plate Glass Goods

Description of the Up-to-date Works of the Toronto Plate Glass Importing Company, Toronto, and Brief Outline of the Methods Employed Therein

Unloading Large Case of Plate Glass.

In these days it is most essential for everyone engaged in building and allied work to keep closely in touch with the developments of the various industries connected with his field. It is a matter of primary importance for all concerned that each one should have more than a superficial acquaintance with the materials of construction and finish which he is called upon to specify or employ in his particular sphere. The architect especially will be well advised to avail himself of every opportunity to improve his knowledge in this regard, for, with the exception perhaps of the design itself, nothing is of greater importance to the client than a judicious selection of the best and most durable materials which are to be obtained at the lowest price consistent with good, reliable workmanship Such thoughts as these are borne in upon one with peculiar significance after a visit to such an industry as that conducted by the Toronto Plate Glass Importing Company, Toronto. The excellent work which has at all times issued from this company's plant and the policy of improvement followed by the directors have won for the concern a reputation which is regarded by the company as one of its greatest assets.

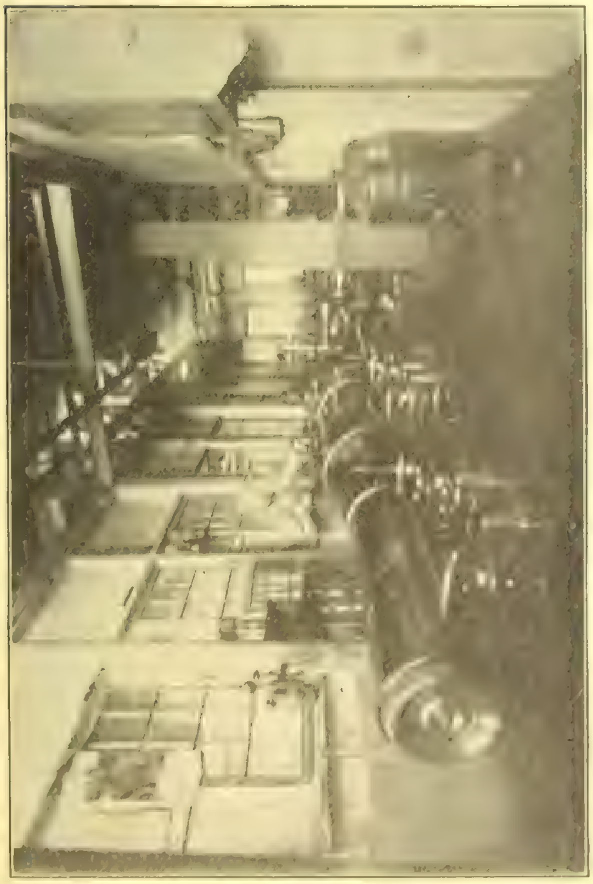
Upon a visit to the offices and works last week, the "Contract Record" was very kindly received by the management and conducted over the plant. The works, warehouses and offices are extensive, but compact and easily reached. They are situated on the Don Roadway, near the Queen street east bridge, over the Don river, ten minutes by street car from the corner of Yonge and King streets, the centre of the city. The company claims that its plant is the best organized and equipped of its kind in Canada and we are credibly informed that it is not surpassed, if equalled, by the works of the United States companies. Indeed, the fame of the Toronto concern has extended to many parts of the States, proof of which has been furnished by the visits of leading American glass workers in the interests of their business.

The business is managed by Messrs. Edwin Hill and Samuel J. Rutherford. The works and machinery were planned and constructed under the immediate personal supervision of the former. The business details of the concern are ably supervised by the latter gentleman. Mr. Hill came to this country from Birmingham, Eng., in February, 1886, having acquired a thorough knowledge of his business in the old country. Mr. Rutherford has been associated with him in the enterprise practically the whole time.

The factory, exclusive of the bending works, covers an area 292 by 123 feet. It is thoroughly equipped with all modern appliances for heating and fire protection.

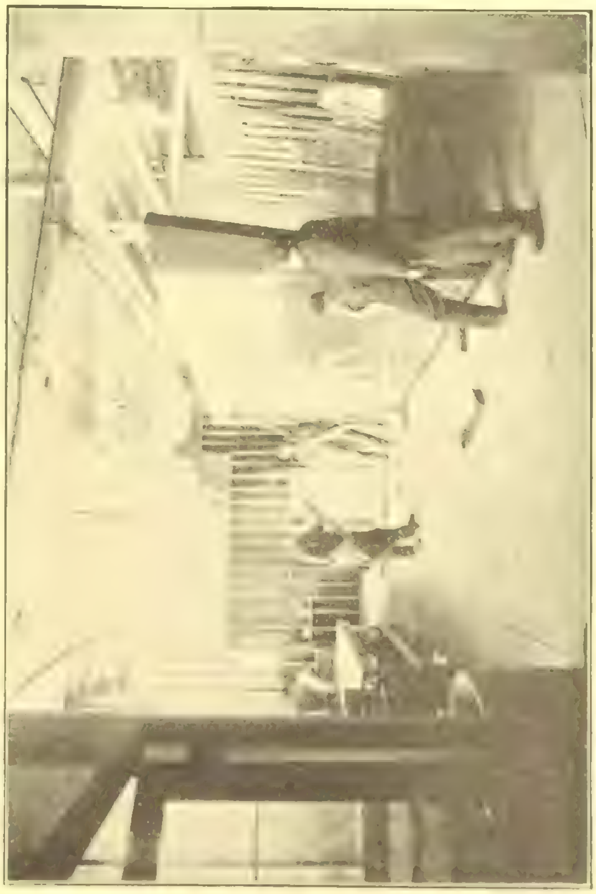
Our attention was attracted by the great ease with which large cases of plate were handled by means of a travelling overhead crane, extending over to the road. By means of this crane, a heavy case of glass is lifted from the wagon and deposited in the warehouse, wherever desired, without further handling. It is then unpacked and stored in spacious racks. Some of these are as large as 20 feet 6 inches high by 13 to 14 feet long.

Racks for Storing Large Sizes of Plate Glass.



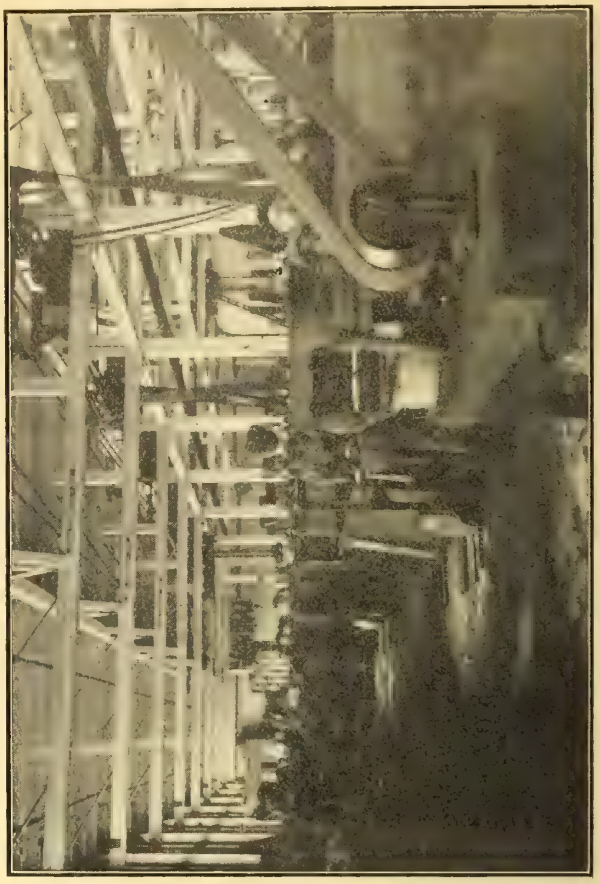
Power House and Machine Fitting Shop.

Examining and Cutting very Large Plates of Glass.

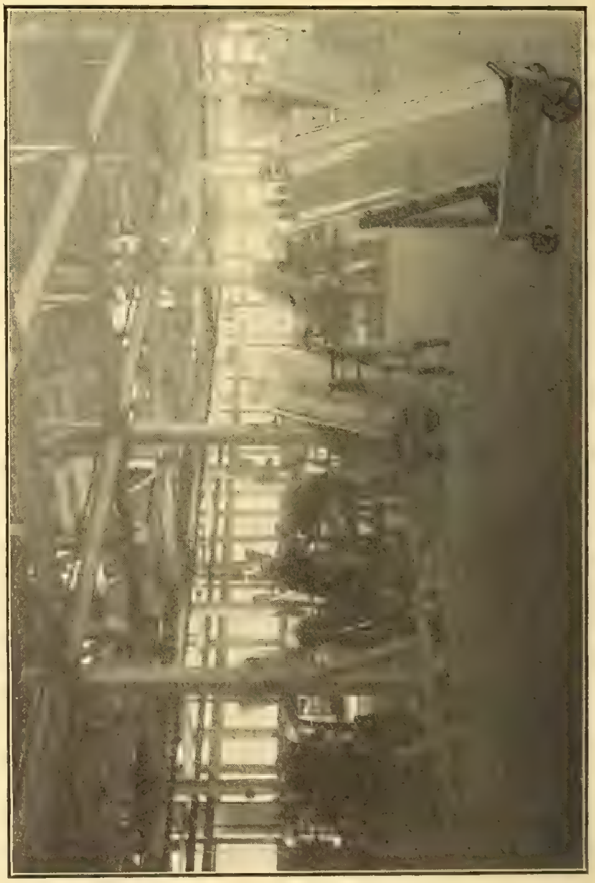


Lifting a Large Plate of Glass on to the Up-Turned Table.

Racks for Storing Medium Size Plate Glass.

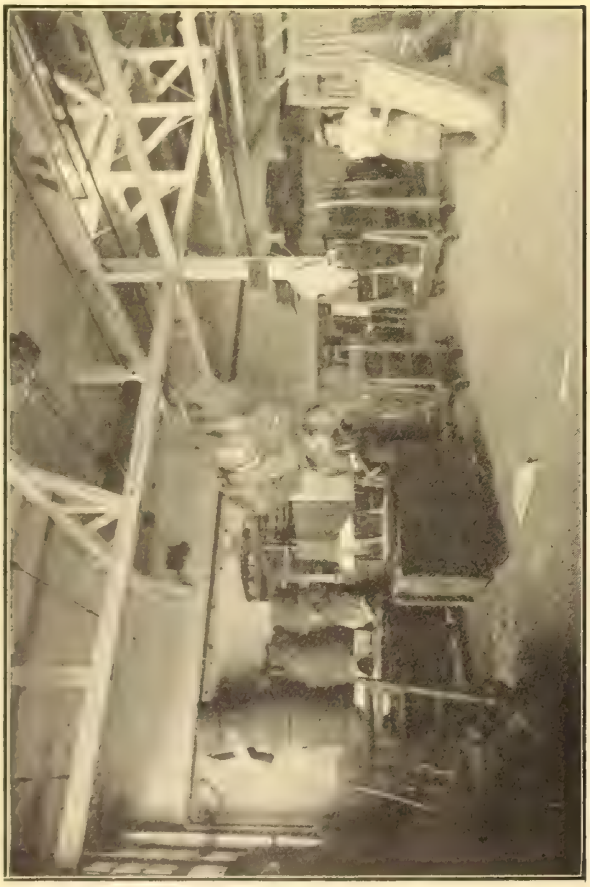


Polishing Machines Driven by Power from Below.



Handling and Bevelling Larger Glass for Show Cases, Etc.

Bevelling Edges of Looking Glass Plates.



Cutting Fancy Edge Plates for Looking Glasses.

and are able to accommodate all sizes that may be in demand.

We cannot show all the exceptional facilities for handling and cutting plate glass, but attention is directed to the three illustrations showing where plate glass of medium store sizes are kept in stock; the lifting of a plate of glass nearly 14 feet long by 9 feet high on to the upturned table — quite a hazardous undertaking — and the cutting and examining of these large plates. Particular attention is given to the satisfactory fulfilment of every detail, and to this is partly attributable the excellent quality of production for which this firm is noted all over Canada.

Silver Plating Looking Glasses.

Applying the Preservative after Silver Plating Looking Glasses.

After passing through a large area devoted to the storage of thousands of boxes of every kind of glass known to the trade, one enters the power room, where the power required in the operation of the plant is developed by a large duplex cylinder engine. Adjoining this is the machinists' shop, well equipped with all necessary lathes, drilling machines and so on. It is here that all the company's machinery is made and repaired.

Special interest is attached to the photos showing respectively the cutting of plate glass to fancy shaped edges, before being passed on to the bevelling shop; the bevelling shop, where looking glass plates are bevelled, and also the larger plates for glass counters, "Silent Salesmen" show cases, and other requirements, also a row of eight spacious polishing machines for putting the final lustre on the surface of the plate glass, so important before it is silver plated and ready for the customer. Other photos show the method employed in silver plating looking glasses and coating the plating with a suitable preservative and the assembling of the numerous looking glass orders and packing of same ready for shipment.

The stained glass department is worthy of special mention. We only show a photo of the cementing section of this department. Cementing the work is a very important feature in leaded work of all kinds. It matters but little how artistic or how pleased one may be with the effects produced by a stained glass window, if it is neither wind nor rain proof there is nothing so annoying. If a stained glass window is not properly cemented and well soldered at the joints, it will go to pieces almost in one season, whereas if it is well constructed it will be durable and give satisfactory service as well as an artistic effect.

The company's bending works are located on Victoria street. Here is where bent glass is "made in Can

Assembling and Packing Mirror Plates.

etc., from the very finest of bent glass for high class cabinets to the very largest of bent plates for large store fronts.

Altogether, in its organization, equipment and facilities, the company has a combination which it would be difficult indeed to improve. This is the impression received by a visitor, but it must not be taken as the policy of the concern, which is one of continued progressiveness. After an inspection of the work of the various departments, one would say that the work turned out here was unrivalled. The company itself is its own keenest competitor—ever working to give the best value at the lowest figure.

In any section of the contracting field where glass is required, particularly in regard to high class residences, store buildings, railway stations and so on, the name of the Toronto Plate Glass Importing Company must be a familiar expression.

The Cementing of Stained Glass.

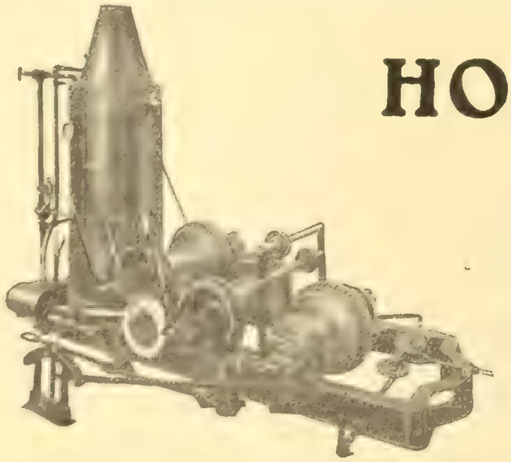
Great Winter for Railroad Construction

The weather in the West has been exceptionally fine and good progress is reported as being made by the builders of the Grand Trunk Pacific. Freberg & Stone, sub-contractors under Foley, Welsh & Stewart, are drilling a tunnel nearly 400 feet long, near Omineca on the upper Skeena river. Five cuts are open and being worked in the contract of Mr. Duncan Ross. Contract for clearing the right of way to Moricetown, 30 miles up the Bulkley valley, has been let, the work to be completed during the winter. Foley, Welsh & Stewart's headquarters camp on the Sealy property, is a busy point and will be busier still with the opening of navigation next spring. All of the supplies for the work 200 miles east of that point will be landed at this camp and forwarded by teams. Warehouses large enough to hold thousands of tons of freight are being built. A number of buildings for offices and for the accommodation of men are also being constructed. Here will be located the main hospital. For the army of builders on the Ontario slope a branch of the Union Bank of Canada will be established, and Burns & Company will erect a cold storage plant to handle the meat supply for the different camps. Construction work on the east end of the Grand Trunk Pacific, also owing to the unusually favorable winter, is still going on. In New Brunswick the rails have been laid from Cains river westward as far as Napadoggan lake, where in the heart of the great Miramachi forest a divisional point has to be established. This work is being done by the Toronto Construction Company, and the work will be continued so far as possible during the winter.

Hamilton Bridge Company Win Suit

The Hamilton Bridge Company won its case against the General Contracting Company of Toronto, getting judgment for the full amount of the claim, namely, $11,700. The amount claimed was for steel supplied in the construction of the grand stand at Lansdowne Park, Ottawa. The construction company refused to pay for the steel on the ground that it was not delivered at the time agreed upon; thus causing them delay which resulted in serious loss to the defendants. The Hamilton Bridge Company maintained that it never guaranteed to furnish the steel at a certain time.

In giving his decision Judge Britton said that he was not called upon to decide whether or not there was such a guarantee, for he believed the evidence of Mr. W. E. Noffke, architect, and City Engineer Ker, who had said that the General Contracting Company had not had the cement work of the grand stand in readiness for the steel work until after the steel arrived. Therefore the defendants had not suffered any injury, as the steel was delivered as soon as they were in a position to use it.



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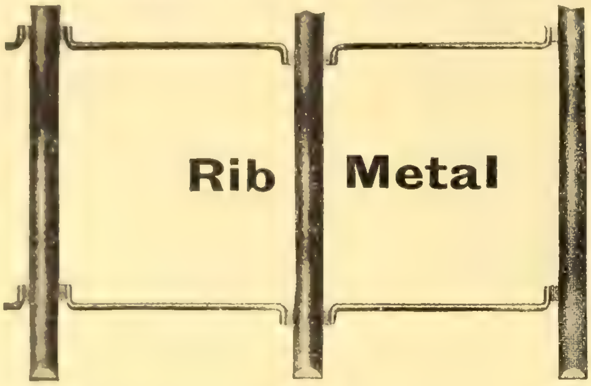

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The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

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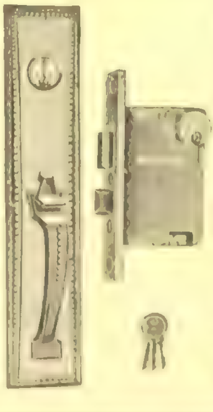
White Lime, Stone, Grey Lime, Brick, Drain Tile.



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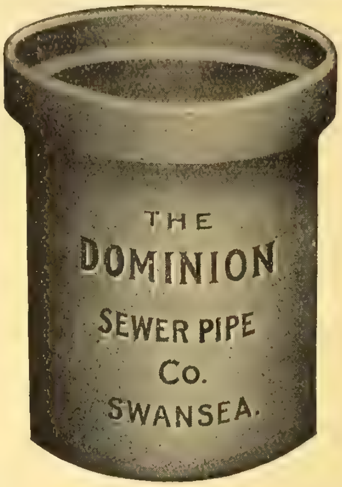

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Sizes manufactured and always in stock 4 in. to 24 in.

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Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

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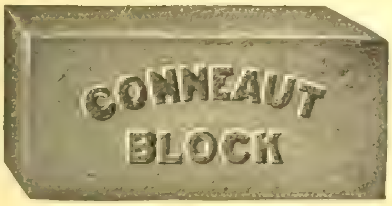

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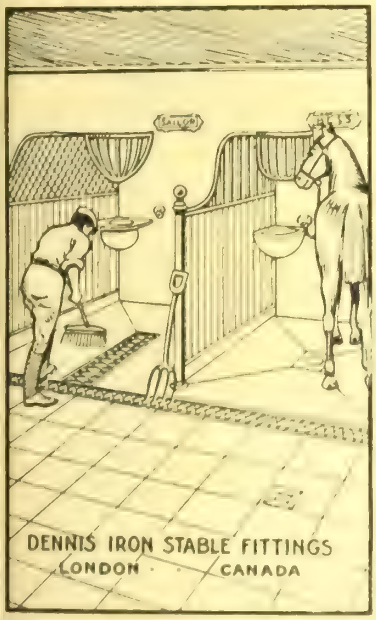

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Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, for foundation work..	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b. with 30 and 5 per cent. off for wholesale:—

	Star	D.D.
10 to 25 united inches........	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7.25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, any color, ¾-in. square, 1-in. hex. and 3-16-in. round, 35 cents per square foot up.
Floor Tile—½-inch square, 45 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 35 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish, colors, firsts, 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G. cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Brass Goods, Valves, etc.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.
Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.
No. 4 compression bath cock........net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Furnaces, 45 per cent.; registers, 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.; other specials, 40 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00

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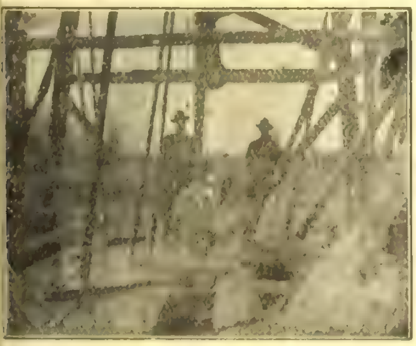

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Lead Pipe.

Lead pipe, 27½ per cent. off.; lead waste, 27½ per cent. off; caulking lead, 4½ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.	Size.	Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 70; malleable bushings, 67½; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 67½ per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.

7 and 8-inch pipe, 40 per cent.
Light pipe, 60 per cent.; fittings, 70 per cent.

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Cement, barrel lots in bags, delivered, Toronto, bags extra, $1.70.
Cement, wholesale lots of 1,000 barrels, f.o.b. Toronto, $1.30.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $13.50 to $15 per toise.
Free stone, delivered, $13.50 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.20 to $1.25 per ton.
Scotch fire brick, delivered, $30 to $35 per thousand.
Steel channels and beams, $2.75 per 100 pounds, delivered.
Lime, per cwt., delivered, 38 cents.
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plasters, $5.50 per ton.

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(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $7.50 to $8.00 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.
Pure Green Seal Zinc White, ground in oil, $12.50 to $13.00 per 100 lbs.
Boiled Linseed Oil, in barrels, 78 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 75 cents per gallon of 9 lbs.
Turpentine, in barrels, 80 cents per gallon of 8 4-10 lbs.
Pure Linseed Oil Putty, 25-lb. tins, $3.25 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $2.75 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

The B. C. Gazette gives notice of the incorporation of the following companies: East and West Lumber Company, Limited, capital $50,000; [illegible] Sawmills, Limited, capital $200,000; Terminal City Sand and Gravel Company, Limited, incorporated to take over the Malahat Sand & Gravel Company, Limited, and the Terminal City Sand & Gravel Company, Limited, to carry on the business in cement, sand, gravel, etc., capital, $250,000; B. C. Lumber Manufacturers' Agency, Limited, capital $50,000; Sidney Manufacturing Company, Limited, incorporated to take over the buildings, lands, etc., of the Sidney Sash & Door Factory, at Sidney, B.C.; Port Alberni Contract Company, Limited, capital [illegible] 000; Fraser River Sand & Gravel Company, Limited, capital $20,000.

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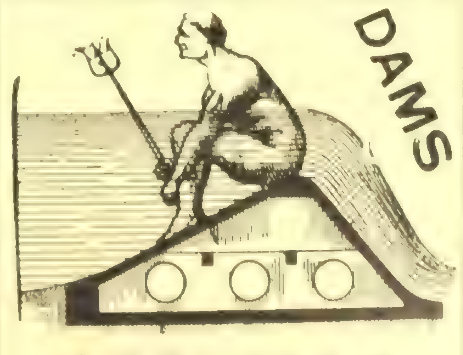

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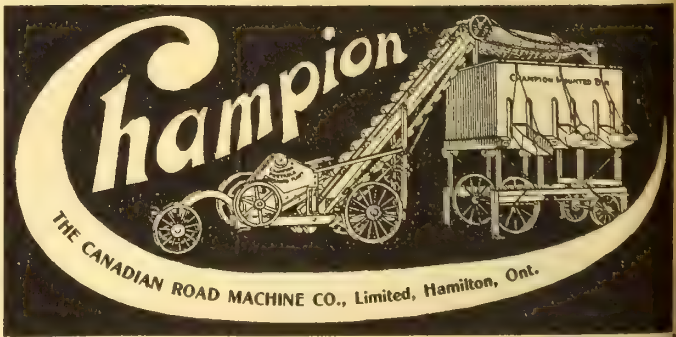
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The Douglas Windows are famous for durability and will outwear any other feature of the building.

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Greater cutting capacity with less power than any other Gang on the market.

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Reducing in Run or Branch

For 125 or 250 pounds working pressure.

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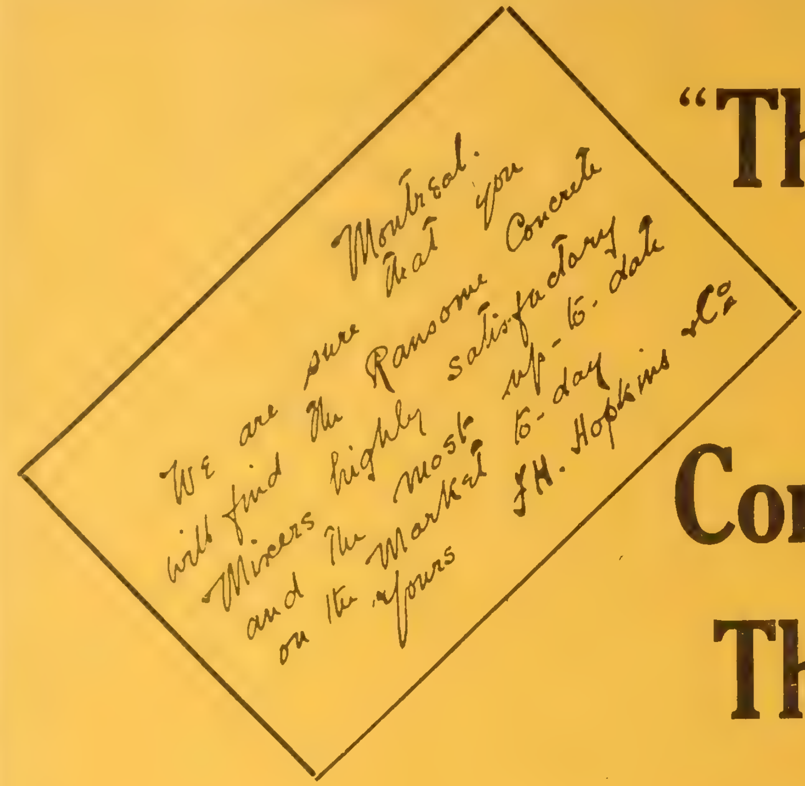

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Yours F.H. Hopkins & Co.

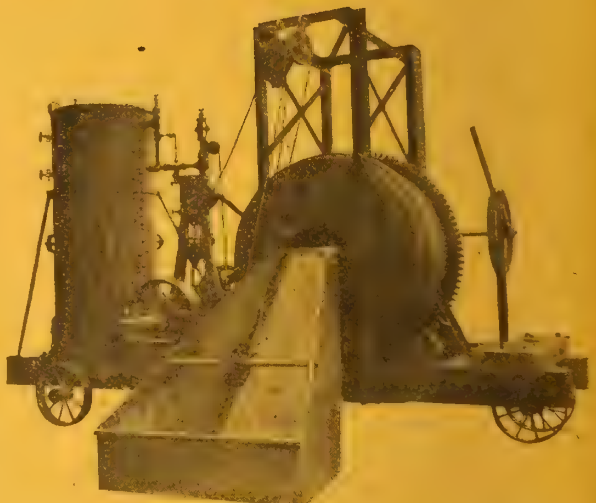
"The Ransome" The Best Concrete Mixer That's Made

Users of Concrete Mixers usually wish to purchase a machine which is noted for its efficiency and durability. Although the Ransome Mixer may be a trifle more expensive than others it is the machine they will eventually buy.

There is no better mixer on the market and wide awake contractors invariably choose the Ransome.

There are many reasons for this and we would like an opportunity to talk the matter over, if you are at all interested in a concrete mixer.

All sizes, with and without power for prompt shipment.



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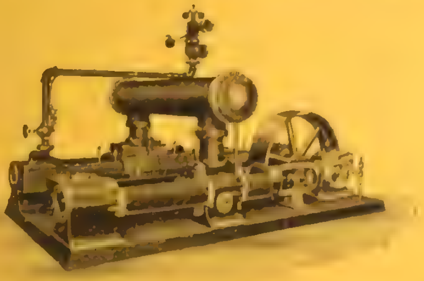

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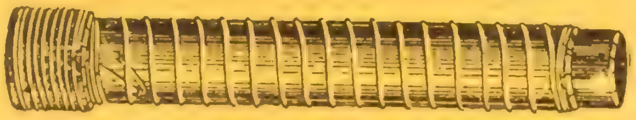

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Scientific Tests of

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Nothing demonstrates the high quality of this famous marble like the report of Prof. H. M. MacKay of the Civil Engineering Department of McGill University, Montreal, who made tests of samples of our output. The following is his report :

Gentlemen,

Following are the results of tests of the samples of marble submitted by you :

Compression Tests

The compression tests were made upon 2 inch cubes and were carried out in the Wicksteed Testing Machine. ;: :: :: ::

"Windsor Gray" Sample No. 1

Area of cross section 3.98 sq. inches.
Maximum load 85,100 lbs. 21,380 lbs. per sq. inch.

Sample No. 2

Area of cross section 4.04 sq. inches.
Mamimum load 86,000 lbs. 21,280 lbs. per sq. inch.

"Eureka." Sample No. 1

Area of cross section 3.86 sq. inches.
Maximum load 84,000 lbs. 21,760 lbs. per sq. inch.

Sample No. 2

Area of cross section 4.04 sq. inches.
Maximum load 92,500 lbs. 22,900 lbs. per sq. inch.

It will be noted that the compressive strength is exceptionally high and compares favorably with the best grades of granite. :: ;: ::

Absorption Test

Two roughly broken samples after having been thoroughly dried were immersed in water for 48 hours with the following results;

	Wt. Before Immersion	After Immersion	Gain	
Sample 1......	1.3770 lbs.	1.3780 lbs.	.0010	0.072
Sample 2	1.9540 "	1.9555 "	.0015	0.076

Specific Gravity 2.71. Wt. per cubic foot 169.5 lbs. The percentage of moisture absorbed is thus remarkably low, which indicates, in my opinion, a stone which should have exceptionally good weathering qualities.

Yours very truly,

Montreal, July 13, 1909. Sgd. H. M. MacKay.

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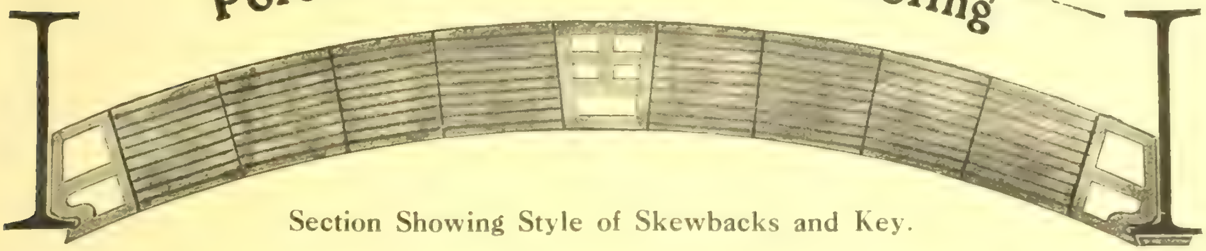

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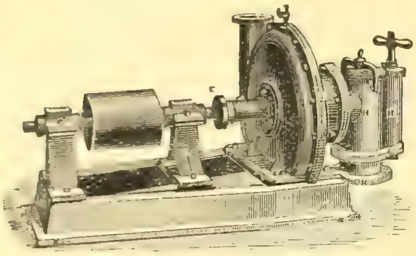

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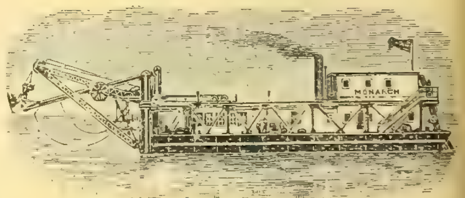

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If you are NOT particular about your reputation most any hardwood will do, but "EMPIRE BRAND" makes a floor that is a credit to any contractor.

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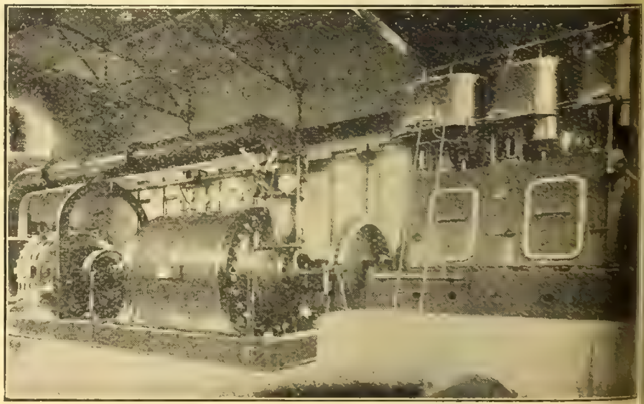

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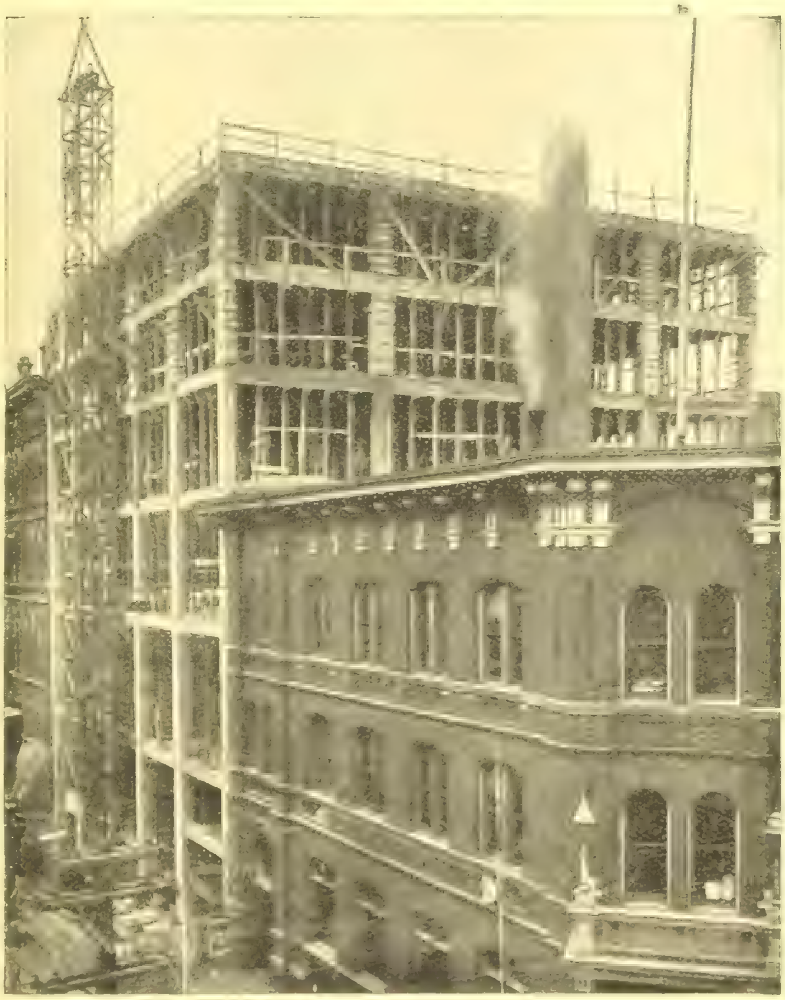

Cut shows Reinforced Concrete Building under construction for the Thomas C. Watkins Departmental Store, Hamilton.

Some Users:

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This System of Concrete Reinforcement is rapidly becoming known as "The Most Satisfactory and Economical System" on the market. One million square feet of Triangle Mesh sold in Canada during 1909, its first year, attest its popularity among discriminating Architects, Engineers and Contractors. If you are contemplating or have under construction a modern fireproof building it will pay you to investigate "The Beath System."

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> "I cannot doubt but that the manner in which the defendant has offered its goods to the public, advertised them—the similarity of the labels; similarity of combination in catalogue, the use of the word 'STANDARD,' were fitted to deceive the public, and are proved, in some instances to have deceived the public. Nor can I doubt that such deception was the object kept in view by the defendants' manager." — Extract from Hon. Mr. Justice Archibald's judgment in recent suit of the Standard Sanitary Mfg. Co., Pittsburg, Pa., against the Standard Ideal Co., Port Hope, Ont.

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Provides Unlimited Possibilities for the Builder

The accompanying photo is an actual illustration of where Truss Fabric helped to transform a "rusty" old homestead into a beautiful and secure residence.

THE Cement Stucco house has come to stay. It's the house that can stay in spite of fire and earthquake and climate.

Whenever the building man plans to erect a new cement stucco structure, or to cement over an old brick or stone structure, he is in need of Truss Fabric. Why? Because, as it is well known that the re-enforcement of a wall is a greater factor in resisting the strains of tensile forces than the actual wall itself, much necessarily depends on the character and reputation of the re-enforcement.

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PEDLAR *Truss Fabric*

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Truss Fabric is equally suited to buildings in course of erection where it would generally be applied to wood sheathing, or to buildings already completed where it would be applied to brick or stone walls.

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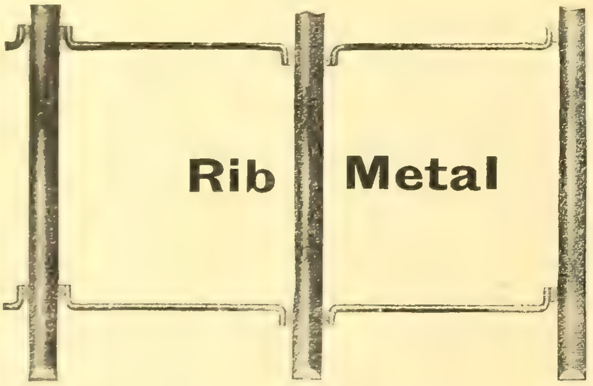

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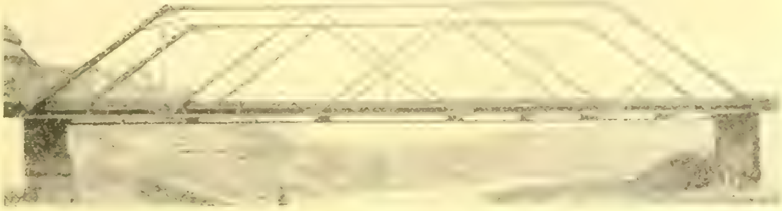

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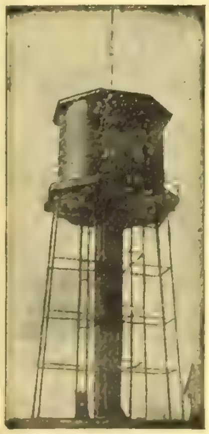

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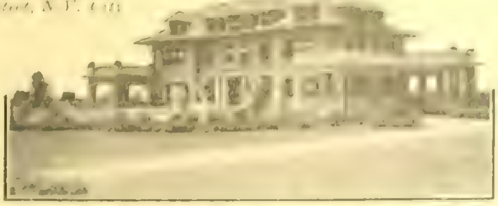
*Harry Allan Jacobs,
Architect, N.Y. City*



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For shingles, siding and other exterior woodwork
Cabot's Sheathing and Deafening Quilt
The warmest sheathing and the perfect sound deadener
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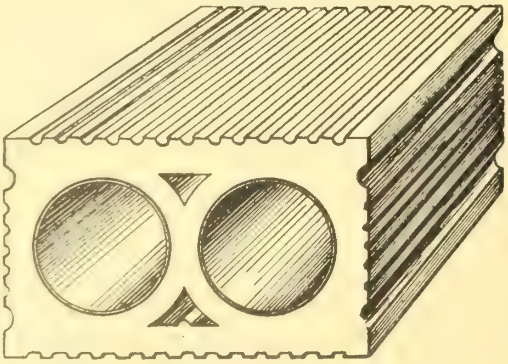

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because they are galvanized in strict accordance with British Government Specifications. Builders would be foolish to buy an inferior brand, when "ACORN" sheets cost no more, and last longer.

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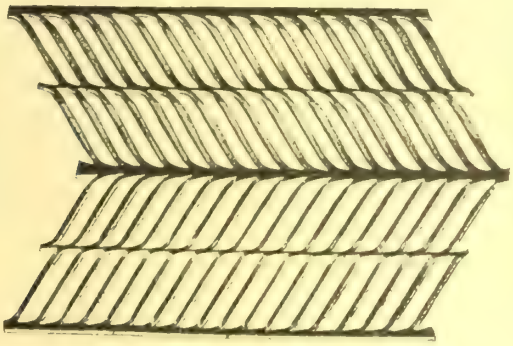

Herringbone Editorials Number Three

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In 1908 about half the Herringbone output wa ld japanned. In 1909 it was ninety per cent. A markable increase occured in the total sales too here is a moral to this tale for you.

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is one of the most important materials used in building and therefore the best brand should be employed to obtain successful results.

Port Credit Brick

has a maximum density and a minimum power of absorption. It is a rich red color, strong and lasts well.

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GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE
FOR WATERWORKS SYSTEMS
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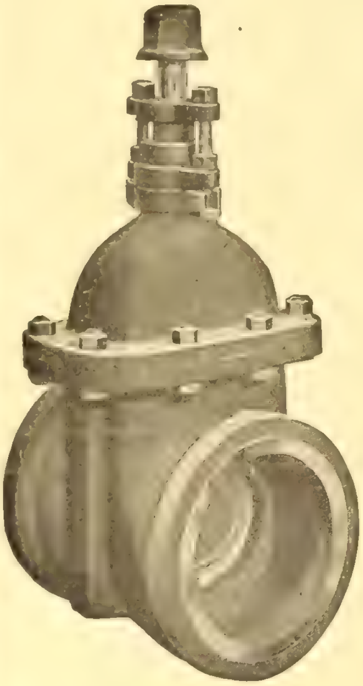

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that are tight when closed and have fnll area when open.

Municipalities making extensions or installing new systems should not place their contracts untill inspecting our Hydrants, Valves and Valve boxes.

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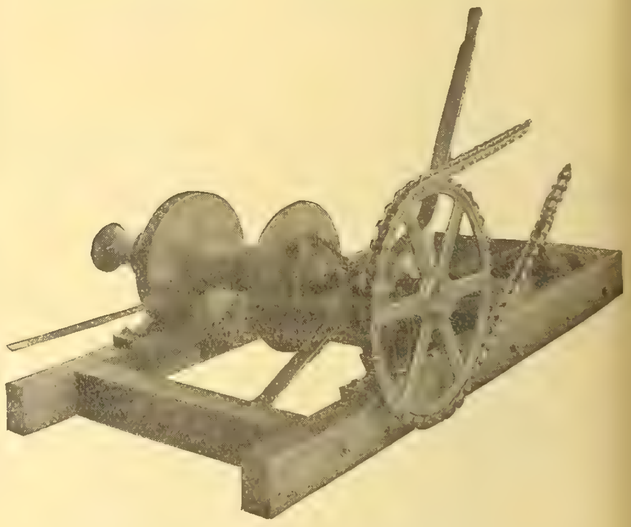
Friction Clutch Hoist



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3 inches to 60 inches diameter
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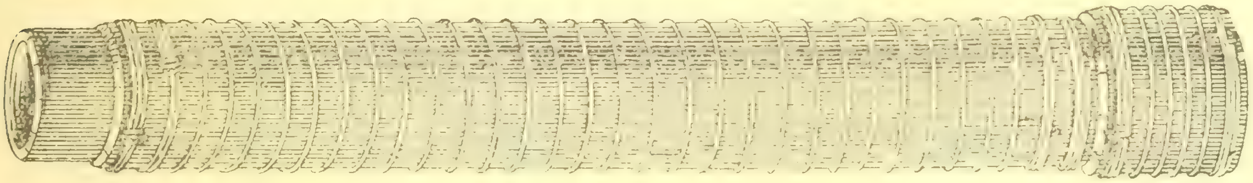
Galvanized Wire Wound and Continuous Stave Pipe for Waterworks, Power and Irrigation, etc., etc.



DURABLE, ECONOMICAL, and NOT affected by RUST, CORROSION and ELECTRICITY and is practically FROSTPROOF. Prompt attention to all enquiries. Write for catalogue.

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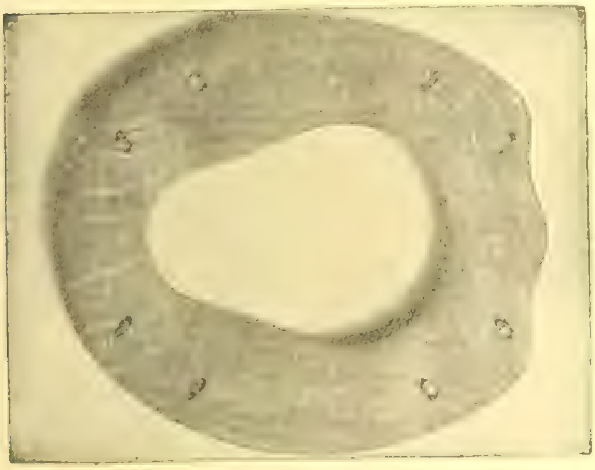
Architects and contractors who desire the reputation of always choosing the best material will act in their own interests by specifying the "NEVER-SPLIT" CLOSET SEAT.



These seats are make in four sections which are tongued and grooved, glued together and held rigid by a heavy bolt at each joint.

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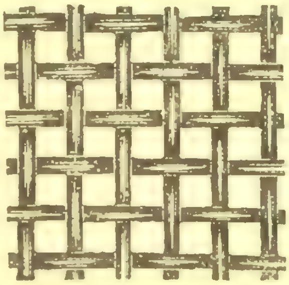

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There is no kind of Wire Fabric required in the production of any machine or manufactured article that we cannot furnish.

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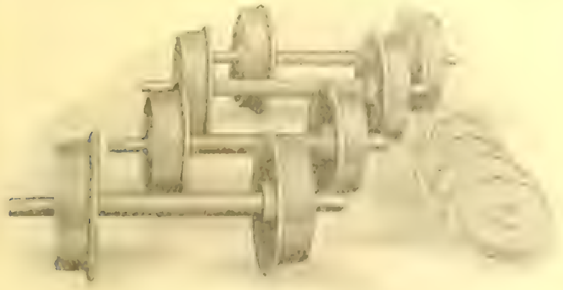

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is made of **stone**; **is** of the **same material** from **face** to **back**; **can** be **cut** or **carved** similar to natural stone; is **specified** by **leading Architects. For prices** for all kinds of Ornamental Work, Sills, Heads, Ashler, etc., write

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GERMAN ALSEN, at higher prices than competitors, has again this year been awarded the most important contracts of the World, because practical tests by leading Engineers proved its merit and relative economy.

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- **Also enormous quantities for the PACIFIC COAST, AUSTRALIA, ENGLAND, SOUTH AFRICA, &c.** -

There is always a certain trade who will pay for the best. We also make American Alsen, the highest grade of domestic Portland cement.

CEMENT 45 BROADWAY, NEW YORK CITY CEMENT

We protect our customers!
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Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off the curse of modern building trades.

The standard of excellence is marketed in

"Hammer Brand" Hard Wall Plaster

HARD-WALL PLASTER HAMMER BRAND HILLSBOROUGH, N.B.

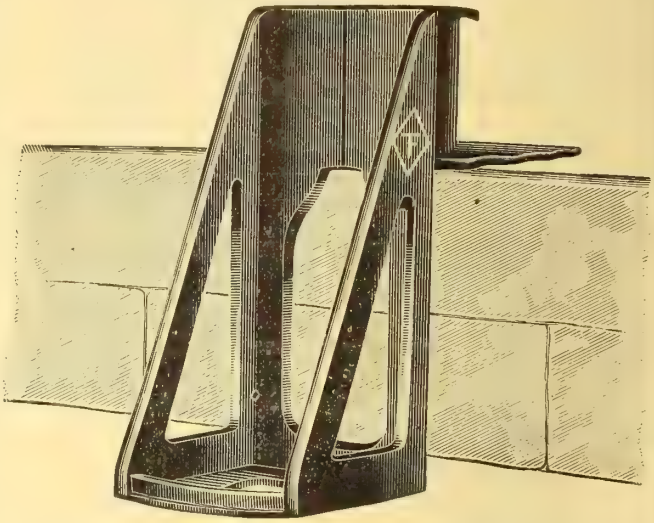
It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.

Hillsborough, New Brunswick, Canada

Builders' Joist Hangers

ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalogue we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE.

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TAYLOR-FORBES COMPANY, Limited

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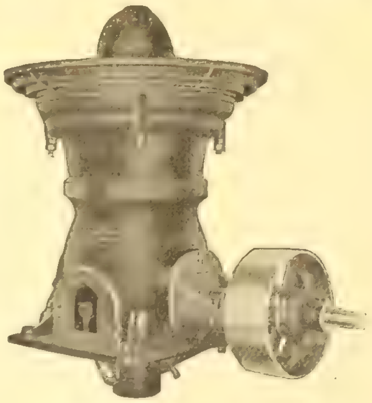

That's the story all the world round—both in operation and in repairs. This is the sort of crusher you can use to good advantage.

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New York Office: 115 Broadway.

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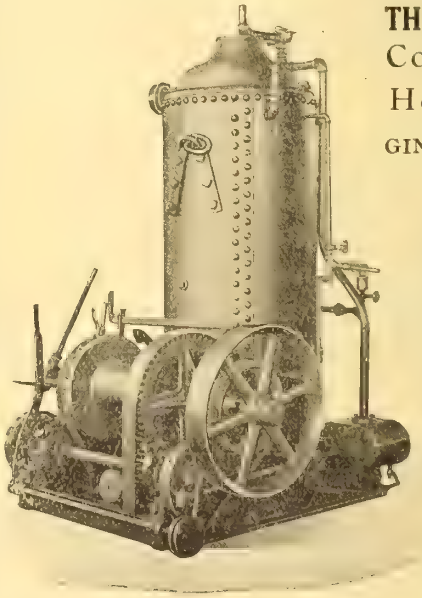
Hoisting Engines

from $4\frac{3}{4}$ x 6 to 8 x 12 in. IN STOCK FOR IMMEDIATE DELIVERY.



THE "MIDLAND" CONTRACTORS' HOISTING ENGINE will operate your material elevators, do light pile driving, Run a pump or circular saw.

Catalogue and prices on request.

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Cast Iron Water and Gas Pipes and Specials

Carried in stock, from 2" to 12", for prompt shipments. Standard Weights and Tests.

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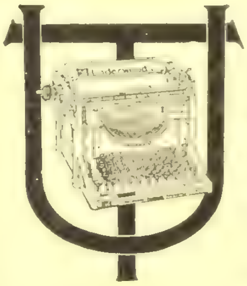
Maple Flooring

WE have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co.
Woodstock, Ont. Limited



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Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
Bored and Bundled.

Manufactured by

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Write for particulars and samples.

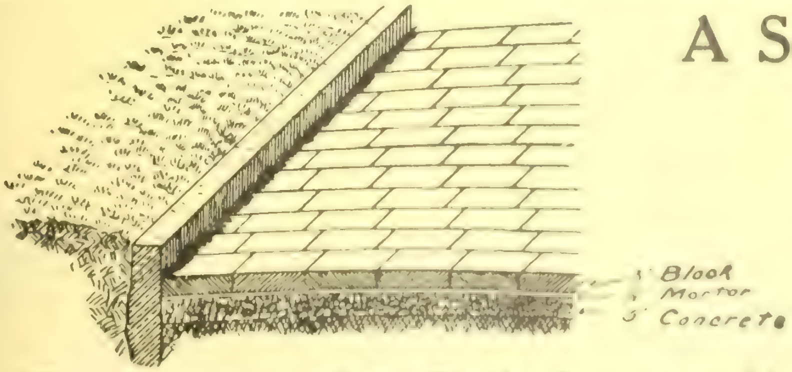
Attractive Ornaments

We are specialists in this line

Roman Ionic Capital

Manufacturers of Capitals, Brackets and Relief Ornaments

McCormack & Carroll, 82 Adelaide St. E., Toronto



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

There's One Best Cement

VULCAN PORTLAND CEMENT CO. LTD.
VULCAN
TRADE MARK
Wm G. Hartranft Cement Co. Ltd.
Montreal P.Q.
Sole Selling Agent
MONTREAL P.Q.

There's a best in everything. There's always a standard by which everything else in the same line is judged. The best cement is

"Vulcan"

Other brands are claimed to be "as good as Vulcan" but why experiment with the "just as good" kind when you can have the standard itself for the asking. Vulcan Cement is

Strong—Uniform—Finely Ground—Carries sand well—Has an exceptionally good color and is positively without any equal for all high-class work.

Always demand Vulcan whether ordering direct or through your Supply House.

W. G. Hartranft Cement Co., Limited

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We Manufacture

Frames - Sash - Doors
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Finest Quality Hardwood Flooring
High Class Interior Work :: ::

OUR ARGUMENTS FOR SOLICITING YOUR BUSINESS ARE EXCELLENT.

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity.
New and well equipped factory with latest and best machinery.
Experienced workmen under the most expert supervision. ::

GIVE US A TRIAL ORDER OUR WORK WILL CONVINCE YOU

Georgian Bay Shook Mills, Limited
Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Fort Erie, Ont.

Press reports state that the city officers re-elected here favor the immediate construction of waterworks. J. J. Foster, Reeve.

Hamilton, Ont.

City Engineer Macallum has prepared plans for a sewage system for the east end annex.

Tenders addressed to John I. McLaren, Chairman, Board of Control, will be received until February 3 for supplying the corporation with sewer pipe, lime, sewer brick, castings, asphalt, paving brick, creosoted wooden blocks, Portland cement, gravel, lumber, lead pipe, pig lead, iron pipe, valves, hydrants, brass work, etc. Specifications at office of the city engineer.

Kamloops, B.C.

The chairman of Water and Light Committee has recommended that another reservoir be built of at least the same capacity as the present one.

Ottawa, Ont.

Dr. R. Law, M.H.O., and City Engineer Ker have been instructed to obtain all the information possible in regard to the water purification question and to look into the question of establishing a municipally-operated ice plant. The Board of Control will ask the city council to agree that Ottawa shall bear one-half the cost of installing septic tanks for the preliminary purification of the Aylmer sewage, on the understanding that Aylmer bear its share.

Saskatoon, Sask.

Tenders are being called for materials required for house sewer and water works service connections, etc., by J. H. Truesdale, city clerk. For further particulars see advertisement in this issue.

Toronto, Ont.

Contracts for the construction of the following sewers have been awarded as follows: (1) Dingwall avenue, Pape avenue to east end, Excelsior Construction & Paving Company, $707, the lowest; (2) Albany avenue, C. P. R. tracks to Davenport road, Excelsior Construction & Paving Company, $1,337, the lowest; (3) Campbell avenue, Lytton avenue to Davenport road, National Contracting Company, $829, the lowest. Other tenders were (1) $819, $768, $869, $880, $1,102 and $895, the City Engineer's; (2) $1,409, $1,398, $1,465, $1,582, $1,449, $1,915 and $1,580, the City Engineer's; (3) $862, $880, $1,190, $1,171 and $1,060, the City Engineer's.

Victoria, B.C.

It is reported that the bylaw to raise $1,500,000 to bring water for the city from Sooke Lake was defeated.

Vancouver, B.C.

The bylaw ($350,000) for street improvements (opening, clearing and [illegible]ing city streets) was carried, as also was that to raise $100,000 for macadamizing and grading streets.

The ratepayers approved of the bylaw to expend $30,000 on the widening of Robson street to Cambie street bridge.

The civic water committee have opened tenders for the supply of pipe for 1910. The specifications called for steel pipe as follows: Three and one-half miles of six inch; one mile of eight-inch, and two and a half miles of twelve-inch. The lowest bidder was the firm of Evans, Coleman & Evans at the following prices: Per lineal foot, six-inch, 37 cents; eight-inch 57 cents; twelve-inch, $1.11, the aggregate amount of the bidding being $24,499.20. The award to the firm was recommended. For 250 tons of four-inch cast iron pipe seven offers were submitted. That of the Robertson, Godson Company at $39.91 per ton was the lowest by a considerable amount. The contract was recommended for the firm at its stated price. The next prices on cast iron pipe were as follows: F. Hankin, $38.35; Evans, Coleman & Evans, for the Stavely Coal & Iron Company, $38.40.

Tenders addressed to W. McQueen, city clerk, will be received until February 8th for the construction of granitoid, Hassam and cedar block pavements, also bithulithic pavements on concrete base and on bituminous base on the following streets, Georgia, George, Burrard, Howe and Beatty. Plans, etc., at office of city engineer, City Hall.

AWARDED.

Montreal, Que.

The Dominion Bridge Company, of Lachine, Que., have been awarded a contract for structural steel for power racks and tail race bridge by the Canadian Light & Power Company. The John McDougall Caledonian Iron Works Company received the contract for cast iron wheel chamber drain pipe in connection with the above company's plant for the development of power at St. Timothee.

Stratford, Ont.

J. Davis Barnet, chairman, Water Commissioners, writes re the recent awarding of tenders: "From the alternatives possible covered by the Stratford Ontario Water Commissioners' recent specifications for turbine pumps and motors they selected the four units clutch coupled on one bed plate, viz., a 50 K.V.A. syn. motor and a million imp. gallon pump, and a 100 K.V.A. syn. motor and a million and a half pump, all running at 1,500 revolutions per minute, with exciter and switchboards; the power being [illegible] volt [illegible] phase current. There were many partial tenders, but the complete bids were: A, $5,185; B, $5,500; C, $6,008; D, $9,175; E, $10,500. The lowest, A, for Lancashire motors and rees roturbo pumps, was accepted.

The Lancashire Dynamo & Motor Company, Limited, of Manchester, England, and Rees Roturbo Pump Co., of Wolverhampton, Eng., will furnish motors and pumps. The contract calls for the whole apparatus to be erected and in working shape [illegible] about July 1st.

Railroads, Bridges and Wharves

Edmonton, Alta.

It is reported from a reliable source that the C. P. R. has secured a large area in the northwest corner of the Hudson's Bay Company's reserve lying between Eighth street and 21st street. The deal has been put through in Winnipeg between the Hudson's Bay Commissioner, C. C. Chipman, and William Whyte, second vice-president of the C. P. R.

Negotiations are being opened for the construction of the high level C. P. R. bridge. Further information: Length, 2,687 feet; height from the river bed to the rail base, 166 feet. It will be supported by four main piers, which will be of solid concrete to the bridge seat. On the Strathcona side there will be ten steel towers, on concrete pedestals, similar in type to those used in the great Lethbridge viaduct. A retaining wall will be built at each end. Total estimated expenditure, $1,500,000.

Quebec, Que.

The following tenders were received for the removal of the Quebec bridge debris: Leopold Stern, Cobalt, $132,000, material to remain property of the government; L. A. Beachemin, Chantillon, Que., one cent a pound, no time stated for completion; Linde British Refrigerator Company, of Montreal, actual cost of labor, etc., plus 10 per cent., the government to retain material, no time stated for completion; Hamilton Bridge Works, $50,000; Chaudiere Machine & Foundry Company, Ottawa, Ont., offered to buy the scrap for $1,000, no offer to remove; Frankel Bros., Toronto, $45,000, could not go on with contract this winter. Noted in issue of January 12th.

Saskatoon, Sask.

Tenders are being called for erection of foot bridge on Twentieth street. For further particulars see advertisement in this issue.

Sault Ste. Marie, Ont.

General Manager Franz, of the Lake Superior Corporation is authority for the statement that in February tenders for the extension of the Algoma Central Railroad will be called. Estimated expenditure, $3,000,000. Probable extension 20 miles, presumably to connect the Soo with the C.P.R. at Grassett.

St. Thomas, Ont.

The plans of the Michigan Central Railway for the improvement of their property it is expected will include the remodelling and enlarging of the shops, the rebuilding of the roundhouse, the extending of the yards, and probably the erection of a new depot. The roundhouse will probably be built this year.

AWARDED.

Toronto, Ont.

The contract for the [illegible] required for the Wilton avenue bridge, has been awarded to Clarence W. Noble, the lowest. The tenders were as follows: [illegible] per lineal foot, [illegible] 32c., 29c., [illegible] 29c., Wakefield sheet piling, 6 by [illegible] inches, supplied and driven to 16 feet per lineal foot, 38c., 35c., 48c., 52c., 45c., [illegible], and 36.

Vancouver, B.C.

Wm. Mackenzie, president of the C.N.R., it is stated, has signed an agreement with the government for the construction of the Canadian Northern in British Columbia.

Winnipeg, Man.

It is stated that the Algoma Bridge Company has filed a tender for the new structure of the Louise bridge.

AWARDED.

Abbotsford, B.C.

The contract for 50 miles of the line of the V. V. & E. to Hope has been awarded to P. Welch, of Spokane, or Foley, Welch & Stewart, Grand Trunk contractors. In the contract is a clause providing that, all other things being equal, construction supplies shall be secured in this province. The contract for the line from Princeton to Otter Flat is stated to have been given them also.

Toronto, Ont.

The Don Construction Company has been given the contract for the piling at Wilton avenue bridge. The tender for 1808 feet of sheet piling is 50 cents per foot, and 18 cents per foot for 16,320 feet of common piling.

Winnipeg, Man.

M. Peterson, secretary, Board of Control, writes that the contract for additions to Louise street bridge has been awarded to Messrs. Wm. Newman & Company, at $17,[illegible].

Public Buildings, Churches, Schools, etc.

Brandon, Man.

A committee was appointed at the annual meeting of Knox congregation on the 12th inst. to look for a building site for a new church.

Brampton, Ont.

Chairman Follis and Trustee Duggan were in Toronto recently interviewing Superintendent Bishop, in regard to the new ten-roomed school building which is being planned.

Cardston, Alta.

It is stated that a rink will be built at once here. Mr. Low is interested.

Campbellton, N.B.

The Bay Chaleur Lumber Company are erecting a new mill at Mission Point, opposite here, to replace the structure that was burned last season. The new mill, it is said, will be larger and superior in every way to the one that was burned.

Edmonton, Alta.

It is stated that Col. Edwards has written to the council that on the resolution being passed that the city would provide a site for the armories, the Dominion Department of Militia would probably make a grant in the estimates at this session of the House of Commons.

Fort William, Ont.

The Seaman Kent Company are establishing a hardwood manufacturing plant. Expenditure on buildings, $75,000. A new dock is also in the plans.

Hamilton, Ont.

The Roman Catholics of this city have decided to erect a new church at the corner of Dundurn and Marguerette streets. Lindsay Wardell, formerly of Winnipeg, has been instructed to prepare the plans, and work will be begun as soon as the frost is out of the ground.

London, Ont.

The congregation of Wellington street Methodist church feel the need of a new Sunday school building.

Montcerf, Que.

The Roman Catholic church was destroyed by fire. Estimated loss, $6,000. Rev. Father Limoges is the parish priest.

Norwood, Ont.

At the annual meeting of the East Peterborough Agricultural Society Messrs. Pearce, Squire and O'Reilly and others, were appointed to consider plans and obtain estimates for the erection of a new exhibition hall and grandstand. Meeting of directors on January 31st.

New Glasgow, N.S.

The council have under discussion the question of new school buildings.

Ottawa, Ont.

Colborne P. Meredith is preparing plans for a brick and stone school building, to be erected at Westboro. Estimated cost, $12,000.

Mr. C. P. Meredith, Sparks Chambers, has been recommended by the board of control as architect for the city hall alterations.

The congregation of Bethany Presbyterian church at its annual meeting unanimously decided in favor of purchasing the McGill property on the corner of Parkdale and Heatherall avenues, on which at some date in the near future to erect a new church. A special committee was appointed, composed of Messrs. A. McArthur, J. G. Young and others.

Prince Albert, Sask.

Plans are before the council for alterations to the city hall.

Prince Rupert, B.C.

Application is being made to the provincial government for a charter for a ten-thousand dollar hospital.

Portage la Prairie, Man.

The city hall was damaged here to the extent of about $4,000.

Port Arthur, Ont.

It is stated that the Canadian Linen and Paper Company get a free site of 50 acres and exemption for ten years. They must expend $250,000 in five years and employ 150 men.

The Canada Artificial Leather Company get a 10-acre site free and exemption for ten years. They are to employ 250 men and expend $400,000.

Regina, Sask.

The city council has ratified the grant of 40 city lots as a site for the proposed armory which is to be erected at a cost of $100,000.

Sarnia, Ont.

Representatives of the council are to meet Col. Hodgins in regard to the proposed site for the armory, which may be erected here.

St. Thomas, Ont.

The Board of Education have secured option on two suitable building sites for the new school.

St. John, N.B.

Secretary Vincent reported for the committee appointed to consider the erection of a new city hall. They asked that $200 be placed at their disposal for preliminary investigation and the procuring of rough plans. Noted in issue of December 22nd.

The Royal Hotel will be enlarged and remodelled. Messrs. Raymond & Doherty, proprietors.

Tilbury, Ont.

The mayor has recommended to the council the consideration of the construction of a new town hall, in the near future.

Toronto, Ont.

Iron stairs will be constructed at once on nine schools for fire exits.

The City Architect has issued a permit for the erection of a four storey addition to St. Michael's hospital, Bond street, north of the present building, to cost $180,000.

Victoria, B.C.

The ratepayers voted against the granting of a free site for the new opera house.

Valleyfield, Que.

The committee of the Presbyterian church have decided to erect a church, hall and school room at an estimated cost of $8,000.

Vancouver, B.C.

The bylaw to raise $230,000 for general school extension was carried, and another for school board offices to cost $42,000.

The ratepayers voted in favor of the exhibition bylaw to spend $85,000 for preparing grounds and erecting buildings at Hastings Park.

The bylaw to expend $50,000 on fire halls was approved by the ratepayers.

Welland, Ont.

At the annual meeting of the Welland County Agricultural Society last week, the directors recommended new buildings. The society authorized the new directors to make an expenditure not exceeding $15,000. President, G. C. Brown.

Winnipeg, Man.

Architect G. W. Northwood has prepared plans and specifications for the proposed improvements to the St. Charles Country Club. It is stated that work will commence immediately and will extend over a period of two years. Noted in last issue.

The Headingly school house was destroyed by fire on the 15th inst. Estimated loss $28,000.

Elaborate plans are being made by members of the Winnipeg Automobile Club for a club house in the vicinity of Stonewall, with a road from there to Winnipeg Beach.

At the annual meeting of All Souls' Unitarian church plans for the erection of a building at an early date were discussed. A. W. Puttee, president, Board of Trustees.

At the annual meeting of the Children's Home, J. Galt, of the advisory board, brought in a report re plans for the new building. The building proposed would cost approximately $80,000, and would afford accommodation for 200 children, with every modern convenience.

It is stated that the congregation of St. Stephen's will sell their present edifice on the corner of Spence and Portage and with the proceeds erect another church. A. Stewart and A. Andison, managers.

AWARDED.

Toronto, Ont.

We have been informed that the contract for the stone work in connection with the erection of St. Paul's church on Bloor street, has been awarded to Page & Company, 89 Crescent road.

Residences

Chilliwack, B.C.

The house of Wesley McIntyre was destroyed by fire on the 8th inst. Estimated loss, $2,000.

Montreal, Que.

Recent building permits include: H. Fortier, 2091 Hutchison street, one house containing three dwellings, cost $4,500; J. F. Charpentier, 157 Papineau avenue, two houses containing five dwellings, cost $8,000; E. Paradis, 443 Joliette, three houses containing nine dwellings, cost $5,500; E. Dufresne, Credit Foncier Building, six houses containing twelve dwellings, cost $1,000; and the following permits for alterations have been awarded: Mr. Aitken, Drummond street, one house containing one dwelling, cost $2,000; Mrs. Jas. Levert, 396 Mount Royal east, one house containing three dwellings and one store, cost $6,000; J. A. Aumais, 1046 Sherbrooke street east, house containing seven dwellings and one store, cost $3,500; A. Meunier, 45 Bonsecours street, one dwelling, cost $3,000.

Ottawa, Ont.

Colborne P. Meredith is preparing plans for a brick and stone residence for Hon. Justice Duff, to cost about $18,000.

Toronto, Ont.

The property on the northeast corner of Beverley and St. Patrick streets has been sold to Mr. David Lavine, who intends to build a six storey apartment house on the corner. The frontage is 86 feet, and the depth is 150 feet.

Victoria, B.C.

A permit has been issued for a dwelling to be erected in the Craigdarroch sub-division by J. W. Spencer, to cost $10,000. T. Hooper, architect; E. Logan, contractor.

A permit has been issued to R. P. Clark for a two storey building of concrete, steel and brick, on the west side of Broad street, between the Salvation Army barracks and Johnson streets. Estimated cost, $8,000. W. K. Wilson, architect.

Winnipeg, Man.

It is stated that a large apartment block will be erected in the spring on Kennedy street on a site recently sold by W. T. Christie.

Plans are being prepared for the apartment block on the corner of Corydon avenue and John street, Fort Rouge, for R. R. Pattinson and W. W. Fraser.

AWARDED.

Montreal, Que.

R. Montgomery Rodden, architect, 8 Beaver Hall Square, has awarded the following contracts in connection with the erection of four houses on Roslyn avenue, Westmount, for Mr. John Stewart, as follows: Roofing, Sibley & Huot; millwork, Itzweire & Sarrazin.

Winnipeg, Man.

L. A. Smart has been awarded the contract for the erection of a residence to cost approximately $10,000. For further information address E. D. Tuttle, 204 Bannatyne avenue.

Business Buildings and Industrial Plants

Bradwardine, Man.

The Windsor hotel was destroyed by fire on the 19th inst. J. France, proprietor.

Bass River, N.B.

The Dominion Chair Company will at once rebuild their factory and warehouse here. Dimensions of former, 200 by [illegible] feet. Estimated expenditure $31,000.

Chatham, Ont.

The Model Malleable Range Company, Limited, have purchased the Byram property on St. George street, with the G.T.R. property to the rear, on which they will imemdiately commence building a plant 160 by 60 feet. J. Piggott & Sons, contractors. President, W. R. Landon.

Calgary, Alta.

The Great West Saddlery Company are contemplating building a horse collar factory and also additions to their wholesale warehouse. E. F. Hutchings, president.

Deloraine, Man.

The office of the Beaver Lumber Company and J. Reid's implement warehouse were destroyed by fire on the 22nd. Total estimated loss, about $10,000.

Edmonton, Alta.

It is possible that next summer the retail meat dealers of the city will build an abattoir in the city for their own use, and operate the business as a joint stock company. Proposed capitalization, $100,000.

Fort William, Ont.

It is stated that J. H. Ashdown, president of the J. H. Ashdown Hardware Company, of Winnipeg, has secured options on two sites here.

Hamilton, Ont.

Plans and specifications have been prepared for the police station which is to be erected with the $50,000 which the citizens recently voted.

Kenora, Ont.

The King Edward hotel was damaged on the 19th inst. to the extent of about $6,000.

Lachute, Que.

The hotel formerly known as the Victoria hotel, was destroyed by fire on the 17th inst. Total estimated loss, $8,500.

Limoilou, Que.

It is announced that La Caisse d'Economie will open a branch here. It is the intention of the directors to erect a branch building next spring.

Lindsay, Ont.

It is stated that Horn Bros., proprietors of the local woollen mills, will erect a large addition to their factory. Etsimated cost $15,000.

London, Ont.

It is expected that plans for remodelling the city hall will be submitted shortly with an estimate of the cost.

Montreal, Que.

A. F. Dunlop, architect, Lindsay building, is mentioned in connection with the proposed extensions to be made on the site recently purchased by the A. E. Rae Company. Noted in last issue.

The grocery store, corner of Amherst and Robin street, owned by M. [illegible], was destroyed by fire on the 17th inst. Estimated loss to property, $10,000.

It is reported that Messrs. Childs Company, of New York, have secured the lower floor and basement at [illegible] McGill street, which will be fitted up as a first-class restaurant. H. G. Stone, 84 St. Francois Xavier street, is the architect.

G. A. Monette, architect, 97 St. James street, is preparing plans and specifications for the erection of a new four-storey building on St. Catherine street, opposite La Patrie Building, for Messrs. H. P. Labelle and Company, Limited, [illegible].

Ottawa, Ont.

Messrs. Henry Birks & Sons, jewellers, Sparks street, who will occupy the building now occupied by the Murphy-Gamble Company, Limited, on their removal to the Carling Building, are, through Architect C. P. Meredith, awarding contracts for extensive alterations and improvements.

Port Kells, B.C.

The Railway Commission of Canada has issued an order to the Great Northern to erect a passenger and freight deport here with a 60-foot platform.

Peterboro, Ont.

The Quaker Oats Company will commence shortly the construction of a large warehouse, 294 by 50 feet, and four storeys in height. Materials, brick and concrete. Estimated cost, $80,000. W. H. Denham, local manager.

Quebec, Que.

The St. Lawrence Car Works, Limited, was recently incorporated by a number of Quebec railroad men, and it is stated that they will erect a plant in this city with a capacity for turning out 600 cars yearly.

It is stated that the National Transcontinental Railway Commission and the railway companies have agreed on the Champlain market as the site for their terminal.

It is announced that a recently formed company will erect next summer a cotton factory on the shore of the Haha river, a mile from the village of Grand Bay. I. Tremblay, F. Bergeron and J. Dufour are interested.

St. John, N.B.

The Canadian Wood Working Company, now located in Hampton, desiring to locate in Lancaster, has been given the desired privileges by the municipality.

The building owned by the Lawrence estate was destroyed by fire on the 22nd inst. Total estimated loss, $15,000.

Souris, Man.

Superintendent J. A. Macgregor is in charge of the operations of the C. P. R. in reference to land purchase mentioned in last issue.

St. Hilaire, Que.

The nitro-glycerine works of Hamilton Powder Company were damaged to the extent of about $2,000.

Toronto, Ont.

Tenders will be received until January 24th for all trades required in the erection of office, warehouse and cold storage building at Front and John streets. Plans, etc., at office of F. H. Herbert, architect, 65 Adelaide street east.

Vancouver, B.C.

It is understood that Mr. P. Welsh, the Spokane railroad contractor, will build on the fine site diagonally across from the C. P. R. depot, this year.

In all probability Mr. Jonathan Rogers, capitalist, who owns the southeast corner of Granville and Pender streets, will build a large office structure.

J. S. Hellyer, architect, has prepared plans for a three storey and basement brick block to be erected on the southwest corner of Pender and Burrard streets by Messrs. [illegible] and E. W. MacLean.

Canadian Pacific Architect Painter is the authority for the statement that work will be commenced in a month on the enlargement of the Hotel Vancouver, and will continue five years. The plans provide for a hotel of six hundred rooms.

Victoria, B.C.

The Western Canada [illegible] and Boxboard Company, Limited, recently organized by [illegible] of Vancouver, [illegible] preparing to erect a large plant at Sapperton [illegible], for the manufacture of box board, building papers, roofing, etc.

It is stated that the fishing company of British Columbia, of which L. Finch is president, will erect shortly an oil and fertilizing plant on the site recently secured at Massett Inlet. On the thirty-two additional lots dwellings for employees will be erected.

Winnipeg, Man.

W. H. Rowley and G. H. Milton, joint managers of the E. B. Eddy Company, at Hull, Que., are contemplating the location of branch factories in the West. Fort William and this city were visited. J. B. Persse, Winnipeg representative.

It is stated that the Great West Saddlery Company will build in the spring a new factory opposite their persent one on Market street east. Dimensions, 85 by 100 feet. Estimated cost, $75,000. E. F. Hutchings, president.

The Canadian Bank of Commerce has purchased property north and south of its present building, and plans are being prepared for a new structure on the site, which will have a frontage of 105 feet.

AWARDED.

Bathurst, N. B.

Mr. Herbert Evans, of the Leonard Company, has been awarded the contract by the Nepisguit Lumber Company, Springfield, Mass., for large Corliss and Tangye engines, 1,200 horse power, for their new mill at Bathurst.

Petrolea, Ont.

The contract for the erection of the branch office of the Bank of Toronto here has been secured by the J. & J. Kerr Company, and work on same will be started as soon as weather conditions will permit.

Power Plants, Electricity and Telephones

Armstrong, B.C.

The Shuswap Falls Light & Power Company is negotiating for the purchase of the local electric light plant. The construction of an electric railway connecting Enderby, Armstrong and Vernon with Grand Prairie and Salmon River is under consideration by the company.

Bridgeburg, Ont.

The Canadian Niagara Power Company will erect a power plant here at a cost of $6,000.

Calgary, Alta.

Smith, Kerry & Chace, Confederation Life Building, Toronto, are calling for tenders for two 4,000 K. V. A. generator units with 6,000 horse power turbines for switching equipment and transformers for the generating station and for the terminal station this city. These will include three 2,000 K. V. A. transformers at present, although prices are being asked on six, which will be the total equipment. At the generating end the transformers will be 55,000 volts and 50,000 at the terminal station.

We have been informed that the general work in connection with the Calgary Power & Transmission Company, referred to in last issue, is now about half completed and will be delivering power to Exshaw in the spring, and to this city in June.

Chatham, Ont.

It is stated that preparations are being made by the Chatham Gas Company to furnish electricity to operate the system of the Chatham, Wallaceburg & Lake Erie Railway Company. The gas company will install a 250 kw. motor generator set, to be used in connection with a 275 kw. alternator. P. S. Coate is secretary and manager. Noted in issue of January 12th.

Dunnville, Ont.

Bradford & Bradford, barristers, of Dunnville, have written to Hamilton for information about poles, T rails and wires required for the projected electric line.

Dawson City, Yukon.

It is reported that preparations are being made for the construction of a power ditch near the north fork of the Klondike river in the spring. The water is to be carried eight miles to a point on the main river, where it will have a fall of 30 feet, and will be utilized to generate electricity, which will be transmitted to points along the Hunker or over the divide. A. N. C. Treagold is interested in the enterprise.

Fort William, Ont.

Double tracking and extensions to the street railway, including the purchase of four new cars, which will cost $137,000, will be made here shortly. A. McNaughton, Clerk.

Lunenburg, N.S.

The ratepayers will be asked to decide on the 24th inst. on the advisability of purchasing the electric plant at $65,000, thus increasing the present efficiency. Councillor Whynacht is interetsed.

London, Ont.

The time limit set for receipt of the tenders for equipment for power station, it is stated, has been placed at February 1st. Noted in last issue.

The question of the advisability of electrifying the London & Port Stanley Railway was taken up by the new directors at a meeting last week, and a committee, consisting of ex-Mayor Stevely and others, appointed to report.

New Westminster, B.C.

The Conteau Power Company has recently made an application in Victoria for a franchise to build an electric railway.

Nelson, B.C.

Tenders addressed to E. B. McDermid, secretary, Nelson Street Railway Company, Limited, will be received until February 1st for poles, ties, etc. Delivery is to be made on or before March 15th.

Tenders addressed to E. B. McDermid, secretary, Nelson Street Railway, will be received until February 10th for the following material, prices to be f. o. b. Nelson: 123 tons of 56-pound steel rails, 32 kegs spikes, 5½ by 9-12-inch, 600 tin plates suitable for 56-pound rails, 1 left-handed turnout, consisting of split rail switch, frog and two guard rails, with all necessary rods and sliding plates. Separate tenders may also be put in for 123 tons of 56-pound relaying rails. Time of delivery to be stated by tenderer.

Prince Rupert, B.C.

A citizens' meeting held on the 6th inst., appointed a committee, consisting of Thos. Dunn, Alfred Carss and others, to employ an engineer to value the plant of the British Columbia Tie & Timber Company, and advise as to the best way and means of establishing a permanent lighting system.

Port Arthur, Ont.

Welford Beaton, Seattle, is quoted as saying that a complete chain of long distance wireless telephone towers connecting the Pacific coast stations with those now doing a commercial business in cities along the Great Lakes will be erected during the coming summer in cities in Alberta, Saskatchewan and Manitoba, and in Kenora and Port Arthur.

St. Catharines, Ont.

At the last meeting of the directors of the Dunnville, Wellandport and Beamsville Electric Railway it was decided that connection with St. Catharines must be a part of the programme.

St. John, N.B.

Included in the estimate of expenditures on account of the Light Department for 1910 is an item of $23,500 for 314 arc lamps at $75, while large amounts will be spent by the Fire Department on hydrants, hose and fire alarm supplies generally.

Toronto, Ont.

Tenders are wanted for approximately $8,000 kw. of 13,800 volt transformers. For information apply at once to Electrical Department, City Hall.

Tenders addressed to G. R. Geary, Chairman, Board of Control, will be received until February 8th for the construction of feeder conduit runs and manhole at the terminal station. Specifications at the Electrical Department, City Hall.

Preparations are being made by the G. T. R. Company to install a telephone system on a portion of the Northern division, which will be used as an auxiliary to the present telegraph service.

Winchester, Ont.

The present street lamps are being replaced by 60-watt tungsten lamps. Thomas O. Van Bridger, local manager.

Winnipeg, Man.

Controller McArthur has reported to the Board of Control that the street railway company is purchasing hose bridges to prevent blockades in the street car service when hose is laid across the tracks for fire fighting purposes.

Tenders will be received by M. Peterson, secretary, Board of Control, until February 15th for the erection of the power terminal station. Smith, Kerry & Chace, Carnegie Library Building, engineers.

Tenders will be received by M. Peterson, secretary, Board of Control, until February 28th for the erection of five wire fences and gates, along both sides of the city's transmission line right-of-way between Winnipeg and the Brokenhead river. Smith, Kerry & Chace, power engineers, Carnegie Library Building.

AWARDED.

Revelstoke, B.C.

Authority has been given by the council for the signing of the contract with W. Newman & Company for the new power dam and gatehouse to be constructed.

Toronto, Ont.

Tenders for the supply of special bricks to be furnished to the electrical branch of the Works Department have been opened, and the contract awarded to the Milton Pressed brick Company, at $16.50 per thousand. One other tender (informal) was received at $20.00 per thousand.

Vancouver, B.C.

It is reported that the British Columbia Electric Railway Company has placed an order with the Allis-Chalmers Company, Milwaukee, Wis., for equipment for steam turbo-generator units which will be used in connection with extension of the service.

Winnipeg, Man.

M. Peterson, secretary, Board of Control, writes that the contract for supply of wire fence and posts for fencing the power transmission line between Winnipeg and the Brokenhead river, has been awarded as follows: For wire fence and gates, The Canadian Steel & Wire Company, Winnipeg, $3,348; for cedar posts, Weatherby & Eklund, Winnipeg, at $3,399.30.

It is reported that the Winnipeg Street Railway Company have let the contract to the Babcock & Wilcox Company, Limited, of Montreal, to instal boilers sufficient to give an additional 3,000 horse power. This will cost in the neighborhood of $35,000, and will simply be maintained as a reserve.

Miscellaneous

Assiniboia, Man.
Tenders will be received until February 1st for $3,493 7-year 5 per cent. local improvement debentures.

Escuminac, N.B.
Tenders are being called for the construction of a wooden dwelling for lightkeeper and a boat house at the light station. Plans, etc., at Department of Marine and Fisheries, Ottawa, and at its agency, St. John, and at the post offices, Chatham, Newcastle, Escuminac and Richibucto. G. J. Desbarats, Deputy Minister.

Edmonton, Alta.
Plans showing the best lay out of grounds, the location of buildings, main entrance, driveways, walks, etc., may be submitted by anyone to the Edmonton Exhibition Association, Limited, until February 10th. The following prizes are offered:—For the best plan, $250; second best, $150; third best, $75; which are to become the property of the Exhibition Association. A. G. Harrison, Manager.

Fort Erie, Ont.
The International Waterways Commission, with offices at Buffalo, N. Y., have completed its report on the advisability of constructing a dam across Lake Erie from the Bird Island pier to Fort Erie to maintain the level of the lake; the report has been signed by the members of both sections of the commission, and sent one copy to the Secretary of War at Washington, D.C., the other to the Minister of Public Works, Ottawa. No facts concerning the findings will be made until these officials have made their reports.

Hamilton, Ont.
The mayor stated that he had hopes of seeing the revetment wall extension started this spring.

In the estimates for the expenditure on public works, it is considered by the council that $500,000 will not cover the cost of the various works, the proposed west end sewer probably necessitating an extra $110,000. $200,000 will be spent on pavements and another $30,000 on general road work and repairs. City Engineer Macallum.

Kingston, Ont.
The city is calling for tenders for hardware, sand and rubble. H. B. R. Craig, city engineer.

The Board of Works have decided to call for new tenders for the supply of 4,000 barrels of cement, or purchase in the open market.

Manitou, Man.
Tenders wil lbe received until February 1st for $15,5[illegible] 5 per cent. [illegible] local improvement debentures. Geo. T. Armstrong, Town Clerk.

Moose Jaw, Sask.
Tenders are being called for two two-horse street sprinklers, steel tanks. For further particulars see advertisement in this issue.

Montreal, Que.
L. O. David, city clerk, writes that the following tenders have been received for steam fire engine: Canadian Fire Engine Company, 1,800 gallons, engine, $4,500; American Lafrance Engine Company, 1,800 gallons, engine, $5,450; Waterous Fire Engine Company, 1,800 gallons, engine, $5,300. For one 75-foot aerial ladder: American Lafrance Fire Engine Company, $5,280; W. E. Seagrave, Walkerville, Ont., $5,400. For fire hose: Canadian Fire Hose Company, 30 St. Francois Xavier street, city, keystone, $1.10; patrol, $1.00; standard, 95 cents.

Ottawa, Ont.
Plans for the biggest drainage scheme projected in Ottawa for years were laid before the Board of Control last evening by City Engineer Ker. The whole of Hintonburg and its environs are to be drained by the system, which will take three years to complete, and will cost $350,000.

City Engineer N. J. Ker has suggested to the civic waterworks committee that two pumps and electrical equipment for the generation of power be installed to increase the fire pressure.

The project of damming the St. Lawrence has been favorably reported on by the International Waterways Commission which recently held a meeting at Buffalo, N. Y.

Regina, Sask.
City bonds to the extent of $250,000 have been purchased by G. A. Stimson & Company, Toronto. They were issued for the following purposes: Electric light, $78,000; sewerage, $59,000; waterworks, $113,000.

Revelstoke, B.C.
The following is a local forecast for the year: Building will be active here this year. New three storey buildings will cover the sites now occupied by the Climax and Queen's hotels. A. McRae and W. A. Foote intend to erect several residential buildings. The Knights of Pithias will build a hall. It is probable a high school building will be erected and an addition made to the public school. R. Howson & Company will erect a large furniture store. The Armour Packing Company will build a warehouse and put in a cold storage plant here next spring. The Bank of Commerce intend erecting a fine office building.

St. John, N.B.
The following amounts have been voted by the council in connection with work to be done during this year: Schools, $136,418; public works, $78,000; sewerage maintenance, $15,000; interest, $27,575; lighting, $26,500; police, $48,000; fire,$ 65,000; ferry, $10,400; city debentures, $54,571; free public library, 5,750; exhibition purposes, [illegible] $12,375; total $480,227.

Toronto, Ont.
Recent building permits include: F. S. Harcourt, 2 1-2 sty. brick addition to dwelling, [illegible] Wilton and George, $2,000; J. M. Hickey, alterations to store front, on 97 Queen street, [illegible] Hill, 2 sty. and attic brick dwelling, near Broadview avenue, [illegible] [illegible] on south side Pinehurst, $4,000; T. J. Ford, 1 1-2 sty. brick dwelling, [illegible] street, $180,000; L. M. Schwartz, 3 sty. [illegible] Edward street, $10,000; J. J. McKinney, 1 pair semi-detached 2 sty. brick stores and dwellings, and 1 sty. brick office attached, near Grace street, on 658-660 College street, $8,000; James Smith, alterations and additions to hotel, southwest corner Queen and Simcoe streets, $10,000; B. J. Case, 2 det. 2 1-2 sty. brick dwellings, near Sunnyside, on south side Westminster, $8,000; S. McLellan, 1 1-2 sty. brick dwelling, near Broadview avenue, on north side Sparkhall avenue, $4,500; C. A. Ward, 3 storey brick and reinforced concrete addition to warehouse, on 28 Oxford street, $4,800.

Victoria, B.C.
Building permits have been recently issued to R. P. Clark, for a two storey and basement block of offices and stores on Broad street, to cost $8,000; to McPherson & Fullerton Bros., for a six roomed house on Beachwood avenue, to cost $2,400; to Lim Bang, for additions to the Majestic Theatre, to cost $2,200, and to W. H. Burton, for a $3,000 house on St. Charles street.

Vancouver, B.C.
Tenders will be received by Wm. McQueen, city clerk, until February 8th for the supply of broken stone. Specifications at office of City Engineer, Burwell.

Building permits have been issued recently as follows: J. Douglas, 27 Tenth avenue west, five houses, $10,000; J. R. Reid, 957 Granville street, $2,500; Western Sheet Metal Works, Howe street, $2,000; H. R. Walsh, 1904 Arbutus street, two houses, $3,800; Catholic church, Campbell and Weefer streets, $2,000.

Winnipeg, Man.
The Board of Control are calling for tenders for street cleaning supplies until February 2nd. Specifications, etc., at the office of the Street Commissioner. M. Peterson, secretary.

Tenders addressed to R. Rogers, Minister of Public Works, will be received until February 3 for the supply of timber required for drainage district No. 19.

The T. Eaton Company, Limited, have applied for a permit to build a tunnel, 21 by 9 feet in width, 8 feet deep and 66 feet in length, under Hargrave street, between the store and the workhouse.

AWARDED.

Buckingham, Que.
Mr. W. H. Kelly has secured the contract for the building of a large tug for the government. It is to be constructed on the Ottawa river.

Montreal, Que.
Canadian Fire Hose Company, 30 St. Francois Xavier street, city, have been awarded by the city the contract for salvage covers, 9 by 14, $11,35.

St. Catharines, Ont.
The Martin Electric Supply & Construction Company of this city has been awarded the contract of wiring and installing a direct system in the dredge constructed by M. A. Beatty & Sons of Welland.

Toronto, Ont.
Tenders for two auto trucks for street sprinklers, etc., have been opened and in accordance with the recommendation of the Medical Health Officer the contract was awarded to the Berna Motor & Taxicab Company, Limited, [illegible] ton, $5,000, 7 ton, $5,500, 10-ton, $6,800.

Tenders and For Sale Department

Proposals

Tenders are wanted for approximately 8,000 k.w. of 13,200 Volt Transformers.

For information apply at once to ELECTRICAL DEPARTMENT, City Hall, Toronto, Canada. 5

Department of Railways and Canals

Dominion Canals

Notice to Dealers in Cement

Sealed tenders endorsed "Tender for Cement" will be received by the undersigned, up to 16 o'clock on FRIDAY, THE 28TH OF JANUARY, 1910, for the supply of some 140,000 barrels of Cement, more or less, required for the construction and maintenance of the various canals of the Dominion and to be delivered in such quantities, at such places and at such times as may be directed.

Dealers in cement may tender for the total quantity required, or for such portions thereof as may suit their convenience.

Specifications, forms of tender and full information can be obtained at the Department of Railways and Canals, Ottawa, on and after this date.

The Department does not bind itself to accept the lowest or any tender.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 12th January, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 4

The Simcoe Railway and Power Company, Limited, Midland, Ontario

Tenders for Hydraulic and Electrical Equipment

Sealed tenders endorsed "Tender for Hydraulic Equipment," or for other respective sections, will be received by the Secretary of the Simcoe Railway and Power Company, Limited, at the Head Office, Midland, Ontario, until February, 1st., 1910 for the following:—

For Generating Station at Big Chute, Severn River.
- Hydraulic Equipment
- Penstocks
- Electrical Equipment

For 27 Mile Transmission Line
- Wire
- Insulators
- Crossing Towers

For Receiving Station at Midland
- Electrical Equipment

Specifications for the above may be seen at the office of the Secretary, Midland, Ontario, or at the office of Engineers, C. H. & P. H. Mitchell, Traders Bank Building, Toronto, Ontario. No tender necessarily accepted.

W. FINLAYSON,
Secretary.

Midland, January 6th, 1910. 4

City of Moose Jaw

Notice

Tenders will be received for two (2), two-horse street sprinklers, steel tanks.

Tenders stating capacity and weight, giving prices f.o.b, Moose Jaw, to be laid on the council table not later than 8.30 p.m., on MONDAY, FEBRUARY 21ST., 1910.

THE CITY OF MOOSE JAW
W. F. Heal, City Clerk.

7

CITY OF STRATFORD

Sealed tenders addressed to the undersigned will be received until 5 P.M., JANUARY, 31ST, for each of the following:

1 Concrete Mixer 7 to 15 yards per hour capacity.

2 Dump Wagons 1½ to 2 yards capacity.

The lowest or any tender not necessarily accepted

M. FERGUSON,
City Engineer.

4

Notice to Contractors

Tenders for 42 inch Steel Intake Pipe

Sealed tenders addressed to the Chairman of the Water Works Committee will be received by registered post only, up to 5 p.m., TUESDAY, FEBRUARY 15TH, 1910, for the supply and delivery of 3,000 lineal feet of 42 inch steel intake pipe.

Specifications, form of tender and full particulars may be obtained on application to the City Engineer's Office, City Hall, Ottawa.

The Corporation does not bind itself to accept the lowest or any tender.

NEWTON J. KER,
City Engineer.

Ottawa, January 24th, 1910. 6

City of Saskatoon

Tenders wanted

House, Sewer and Water Works Service Connections

Sealed tenders will be received at the Office of the undersigned City Clerk untill 5 O'clock p.m., MONDAY FEBRUARY 14TH, 1910, for certain materials required for House, Sewer and Water Works Service connections, including Sewer Pipe, Galvanized Iron Pipe, Lead Pipe, Brass Fittings, Service Boxes and Water Meters.

Instructions to Bidders may be obtained on aplication to George T. Clark, City Engineer.

The lowest or any tender not necessarily accepted.

WILLIAM HOPKINS, Mayor.
J. H. TRUSDALE, City Clerk.

Saskatoon, January 21st, 1910.

City of Saskatoon

Tenders Wanted

Steel Overhead Footbridge at Twentieth Street

Sealed tenders addressed to the undersigned City Clerk and endorsed "Tender A" and "Tender B" will be received, for the construction of a Steel Overhead Footbridge at 20th Street, until five o'clock p.m., on the following dates:

Contract A, Foundations, MONDAY, FEBRUARY 14TH, 1910.

Contract B, Steel Superstructure, MONDAY, FEBRUARY 21ST, 1910.

Plans and specifications, etc., may be seen at the office of the City Engineer, Saskatoon; also at the office of the Canadian Engineer, at the following addresses:

Toronto, 62 Church Street, Phone Main 7404
Montreal, B33 Board of Trade Building, Phone M 1001
Winnipeg, Room 315 Nanton Building, Phone 8142

The lowest or any tender not necessarily accepted.

WILLIAM HOPKINS, Mayor.
J. H. TRUSDALE, City Clerk.

Saskatoon, January 21st, 1910. 5

Situations Vacant

WANTED — Architectural Draughtsman, middle-aged, capable of supervising construction, state experience, salary expected, etc., Position to be filled at once. W. W. LA CHANCE, Architect, Saskatoon, Sask. 4

Miscellaneous

Fine Factory Site—New Westminster, B. C., the coming factory city. Lot 7. Block 36; corner 198 x 132. three frontages; close to tracks and waterfront. Right in city, and already surrounded by industries. $15,000. Snap. Will bring double this inside two years. Investigate. Address P. O. Box 516, Vancouver—owner.

New Companies

Dominion Corrugated Steel Pipe Company, St. Johns, Que., incorporated, capital $20,000. Incorporators, C. H. Richardson, St. Johns, Que.; H. Proctor, and A. Carson Seller, both of Sandusky, Mich., and G. Donaldson, Topeka, Kansas.

Caledonia Gypsum Company, Limited, Hamilton, Ont., incorporated, capital $150,000. Incorporators: H. Lewis and E. Rubenstein, both of Buffalo, N.Y.

Canadian Pressed Brick Company, Limited, Hamilton, Ont., incorporated, capital $40,000. Incorporators: J. H. Williams, contractor; D. New, brickmaker, and A. M. Lewis, all of Hamilton, Ont.

The friends of Mr. H. D. Willmott, representative of the mining department of the firm of Mussens, Limited, will be glad to learn that he came safely through the recent disastrous wreck on the C. P. R. near Sudbury. Mr. Willmott was in the dining car at the time and found himself submerged to the neck. By dint of his own efforts he was able to extricate himself and was the second person to climb out of the car. He was not seriously injured, sustaining only slight cuts on his fingers, but the experience, he says, is one that he will remember for a long time.

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256 Lansdowne Ave.
C.P.R. Crossing North Toronto
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cut and sized to exact dimensions, and if so desired, framed in our yards before Creosoting.

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Capacity after March 1st, next, 1,200 ties per day.

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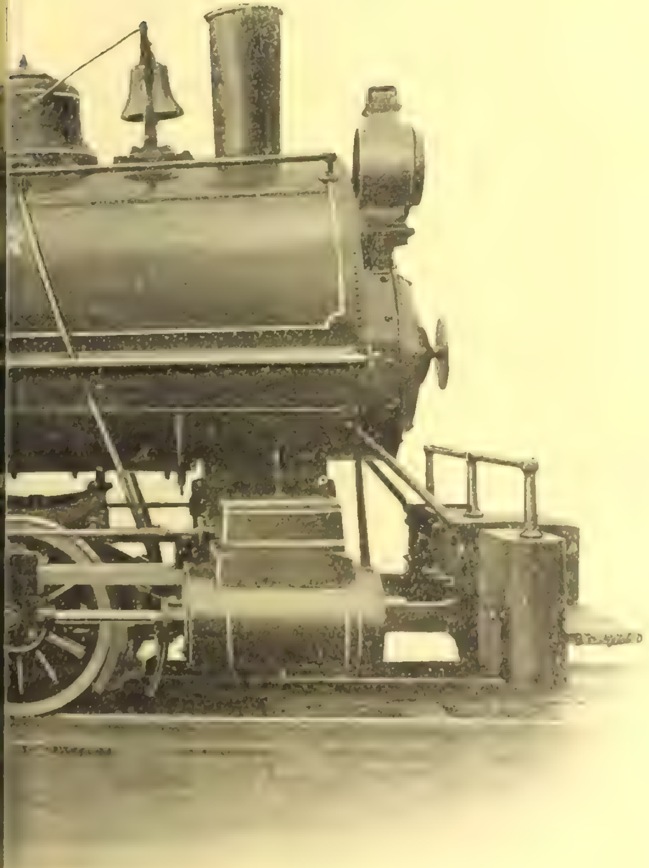

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Vancouver - 614 Hastings St. W.

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Registered under the Trade Mark and Designs Act.

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is a BRANDED BAR.

Our trade mark is rolled in the bar every three feet.

The reason we brand our product is simply because we believe in it, and want to protect it in every way we can.

Inferior products are often **not** branded, and this will apply largely to reinforcing metals. The "NF" bar is protected by a brand because it is **worthy** of a brand. It is made of the very best material by the most careful process.

We not only make the BAR, but we make also the STEEL the bar is made from. We are the only Steel Company in Canada which MARKETS DIRECT its **own** type of bar made from its **own** steel.

Absolutely no re-rolled metal is used by US. This is not a knock at competition, as it is pretty well known in the building trades that many mills **do use** re-rolled metal.

Consider, then, only the brand "NF" on the bar when making up specifications, and you will be safe.

ONTARIO IRON & STEEL COMPANY, LIMITED

Toronto, Ont., Canada

BRONZE ENTRANCE DOORS
Canadian Bank of Commerce, Vancouver.

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Vol. 24 Toronto January 26, 1910 No. 4

Conventions and Rumors Thereof

There is every indication that the annual convention of the Canadian National Association of Builders, which is tc be held at London, Ont., Feb. 8-9, will be a most successful event. Secretary J. H. Lauer, of Montreal, is sparing no effort to make the meeting of great interest to those engaged in building and allied work, and our own idea in this connection is that the convention will be productive of many important and helpful things. While no detailed programme of the meeting has yet been issued, we have an inkling of several papers that will probably be read, and these being based upon subjects of vital interest to the trade, should result in discussions that will bring out many good points. There will be a representative contingent from Montreal leaving that city on Monday, Feb. 7th. This party will arrive in Toronto on Tuesday morning and make connections with the band now being organized by Mr. P. L. Fraser, secretary of the Toronto Exchange. Representatives will be in attendance from Ottawa, Hamilton and other important centres. Inasmuch as the retail hardware merchants' convention is being held the same week, it will be advisable to make the necessary arrangements for accommodation as soon as possible.

Incidentally, the convention of the Canadian Society of Civil Engineers is now in prorgess at Ottawa. This is the day if conventions. Some people are possessed of such wide experience and expert knowledge that they can learn nothing at such meetings as these. But the average man will come back wiser every time. The opportunities which such meetings afford for the interchange of ideas by practised experts have [illegible] much to correct faulty design and slipshod methods of [illegible] tion, to elevate the status of the engineer, and to improve the general conditions under which he works. In every line of human endeavor conditions are changing continually. That which obtained yesterday is behind the times to-day. There are three branches primarily and fundamentally concerned in the development and up-building of a country—the architect, the engineer and the contractor. It is essential for each one of these to keep well posted in the latest things pertaining to his work; consequently he cannot afford to miss the chances of improved knowledge that are to be found at a convention. The best brains and interests are on hand to greet a man and he can always find a few kindred spirits interested in his particular line of work. Our own opinion is that a man might just as well be out of business as out of date in his calling. At the convention, one is afforded an opportunity of comparing his achievements with what others have accomplished. He is able to meet his competitor on terms of friendliness and come to a better understanding of him. He is able to hear the last word in problems pertaining to his work and to lay the lines of future effort in a better direction. In nine cases out of ten he acquires more helpful knowledge in the two or three days of a convention than, left to his own resources, he would obtain in so many months—or even years.

Remuneration of the Building Inspector

Considering what is required of him, the responsibility he is called upon to bear and the technical knowledge and training that he must have in order to occupy the position, it would seem that the average building inspector, as a rule, is about as inadequately paid as any in municipal service. There are some people of a somewhat cynical tendency who will tell you that in civic work it is generally the man who has the most to do who is the worst paid, and that fat salaries are usually identified with easy jobs. We are in rather a delicate position to express an opinion on this point, but we do think there is a measure of truth in it as regards the official in question. After all, the post is no sinecure. The duties attached to the position are both onerous and diversified, and with even the most perfect by-laws to guide him it is necessary that the building inspector be possessed of discrimination and judgment. The average councillor, with his short-sightedness in such matters, fails to see these things in the proper light and thinks a man well paid at a thousand dollars a year, a sum which most journeyman carpenters can earn. He does not take into consideration the experience needed for the work, neither apparently has he an adequate conception of the responsibilities of the post. There are doubtless many excellent men serving as building inspectors in our various cities, but at its present rating it is not likely that the position will either retain these or attract others competent of fulfilling the duties satisfactorily.

As the result of a dispute with one of the leading local firms in the trade, the city painters' association of Regina, Sask., has branched out with a new experiment in industrial unionism by making contracts on its own account without reference to any employer. The dispute arose over the employment of two non-union men engaged in pointing one of the city hotels. Their dismissal was called for by the union men engaged on the job, but the contractor refused to accede to the request, whereupon the men walked out. The men now refuse to return to work under 40 cents per hour, which [illegible]

Annual Reports of Builders' Exchanges

Efforts Made during 1909 and Previous Years—Working Steadily for the Betterment of the Industry—General Optimism Prevalent

The annual meeting of the Toronto Builders' Exchange held on Jan. 17th, was marked by good attendance and enthusiasm in the work of the institution. Reports of the secretary and treasurer, having been found most satisfactory, were duly passed.

Mr. A. Dinnis, president of the Exchange, reported for the Board of Directors the work which had come before that body during the past year. Mr. Dinnis pointed out that the personnel of the Exchange had been considerably changed during the past year owing to the membership cards which had been taken out by members of many of the more important city firms. He considered that the Exchange was now being operated on a most satisfactory basis. In all the various branches of the building trade the Exchagne is helding a higher position than ever before. Mr. Dinnis gave a glowing acciunt of the past year's activity and predicted good things for 1910. Reference was made to the affiliation of the Toronto Exchange with the Canadian National Association of Builders, which was accomplished last May. The Exchange rooms were thoroughly overhauled and decorated recently and the quarters are now most accomodating and comfortable.

Mr. Arthur Dinnis, who was re-elected President of the Toronto Builders' Exchange.

Mr. P. L. Fraser enters upon his secretarial duties for 1910 with every encouragement—and incidentally, with several pet projects for making the Exchange absolutely indispensable to every progressive builder in Toronto.

The election of officers resulted as follows: President, Mr. A. Dinnis (re-elected); 1st Vice-President, Geo. Gander; 2nd Vice-President, Chas. Bulley; Treasurer, Jno. Aldridge. Board of Directors: Messrs. Chalkley, Jennings, Moore, Pears and Rumney.

Brandon, Man., spent $160,000 upon civic improvements during 1909.

Good Year's Work at Montreal

The Montreal Builders' Exchange is to be congratulated upon its successful operation during the past year as revealed at the 12th annual meeting, a brief notice of which appeared in our last issue.

The annual report of the board of directors and financial statement were duly presented by the secretary-treasurer, Mr. J. H. Lauer, and these both being of a satisfactory character, were favorably received and unanimously adopted. In proposing the adoption of the report, the secretary drew attention to the work accomplished by the Builders' Exchange during the past year and to the wide range of subjects which were covered by these activities.

In the first place the most important move of the Exchange was to have well equipped offices of up-to-date and modern type; and in spite of the large financial responsibility involved, the whole additional expense has been met out of current revenue, and the annual statement showed a larger balance on hand at the close of the year than at the commencement. From handling a revenue of only some $900 five years ago, this Exchange has now to provide "ways and means" amounting to nearly $10,000 annually.

The most important local work in connection with the Exchange was the establishment of a Department of Permanent Exhibits, open daily to the public free of charge, the first of its kind in Canada. In presenting the building figures for the past year, the fraternity was to be congratulated on the record total established in 1909, almost $20,000,000 in round figures for Greater Montreal. One danger that beset the contractor, was the anxiety to get work at any price, and this was the cause of a larger number of failures than usual during the past year. There was no reason to repeat this blunder, as there was ample work enough to go all round.

Mr. Lauer drew attention to the technical schools now being erected by the Quebec Government, and the urgent importance of not emphasizing the theoretical side to the exclusion of the practical. The new buildings offer ample room for the inclusion of the trade school, in which full scope can be given to the practical training of craftsmen.

The Exchange has exercised its customary supervision in matters pertaining to Federal legislation. Two important measures merit the attention of employers throughout Canada, namely, the endeavor to extend the operation of the Lemieux "Investigation and Industrial Disputes Act" to all current branches of trade, and the annual appearance of Mr. Verville's "Eight Hour Day Bill" on all Government pubic works. The most important fruit of provincial legislation was "Compensation for Accidents" bill, which, however, has not produced as favorable an effect upon insurance rates as was anticipated.

Improved prospects are held out for obtaining municipal contracts. In this connection the following extract from the report may be of interest: "It is a matter of congratulation to you as contractors and supply dealers, that, as a result of the Royal Commission, a new regime of better things in civic administration is assured in the near future. Under the new order of things, controlled by a Board of Citizens enjoying public confidence, our members who have hitherto abstained from taking any interest in municipal works, from a hopeless conviction that no square deal could be had, should once more come to the front and secure their fair share of civic contracts. Your directors have also made application, and intend to follow it up with the new council, that copies of plans and specifications of all municipal works be filed at the Builders' Exchange so as to ensure a larger field of competition, and better prices for public works."

The election of officers for the current year, 1910, voted as follows: President, J. N. Arcand; Vice-President, Jas. Ballantyne; Board of Directors—A. Bremner, Jos. Brunet, E. G. M. Cape, K. D. Church, W. T. Castle, Thos. Gilday, J. W. Hughes, Wm. Rutherford, T. A. Morrison, Frank Pauze and E. W. Sayer. A cordial vote of thanks was unanimously voted to the retiring officers, the secretary and working staff, whose labors during the past year were greatly appreciated.

Activity at London, Ont.

The twelfth annual meeting of the London Builders' Exchange, which was held last week in the new quarters over the Bank of Nova Scotia, disclosed the most gratifying interest among the members, and the officers and directors have reason to be well satisfied with the results of their efforts during the last few years. The following were in attendance or represented: W. Pace & Son; I. Quick & Son; H. Stratfold; T. R. Wright; Donald Ferguson; Jones Bros.; London Foundry Co.; Wm. Tytler; E. Martyn & Company; Jas. Moran & Sons; Geo. H. Belton; John Nutkins & Son; G. H. Gould; Sutherland Bros.; Scott Murray; A. & E. Nobbs; Geo. Young; Wm. Gerry & Sons; Purdom Hardware Company; Chas. Dyson; Wm. Stevely & Son; Jas. Cowan & Company; Dennis Wire & Iron Company; John Murray; L. H. Martyn; Thos. Redge; Fleming & Houghtby; John Whittaker; Geo. S. Gould.

In presenting the report of the work of the board for the past year, President Whittaker drew the attention of the members to the opening up of the new and commodious quarters on which they had taken a ten-year lease, and which were adapted both for business and social purposes. The Exchange, he felt, would continue to become of more and more benefit to its members. Mr. Whittaker believed that very shortly new building operations would be in full swing, and everybody would have a busy season. Feeling reference was made to the death during the year of Mr. Ed. Martyn, an esteemed member of the Exchange.

Among the recommendations submitted for approval was that the delegate to the Federated Exchanges' convention, to be held here next month, should urge that body to take up with the Association of Architects the matter of having a more satisfactory code of practice established, regarding the calling for and submitting of tenders.

It was decided to entertain the delegates to the C.N.A.B. convention at a banquet on one of the evenings and a committee was appointed to make the necessary arrangements.

The following officers were elected for the ensuing year: President, Geo. Everett; 1st Vice-President, John Jones; 2nd Vice-President, William Nutkins; Secretary-Treasurer, George S. Gould; Assistant Secretary-Treasurer, A. C. Nobbs; Auditors, D. Ferguson and T. R. Wright; Directors, J. Moran, E. Gerry, G. Belton, E. R. Dennis and W. T. Brown; Representatives on Western Fair Board: George Everett and George Belton; Delegates to the Canadian Builders' Convention, Messrs. Everett, Ferguson and Stevely; alternatives, J. Jones, Stratfield and L. H. Martyn.

Votes of thanks were passed to the retiring president, Mr. Whittaker, and to the secretary-treasurer, Mr. Geo. Gould.

The Work of the Quebec Exchange

At the annual meeting of the Builders' Exchange of Quebec, Que., Mr. E. T. Nesbitt was elected president and Mr. E. Cote, vice-president, for the current year. In addition to these gentlemen, the following were elected to the Board of Directors: Alex. Fackney, J. E. Bedard, Hector Jobin, Achille Dugal, A. G. Auger, Arthur Laforce, C. A. Vezina, P. DeCourcy and Chevalier J. Martineau.

President Nesbitt was chosen to represent the Quebec Exchange upon the corporate directorate board of the National Association of Builders. Those who will represent the Quebec Association at the annual convention of this body are Messrs. A. G. Auger, J. E. Martineau and P. DeCourcy. The report of the Board of Directors for the past year was read and duly confirmed, as were the reports of the secretary and treasurer. The latter showed a substantial financial balance to the credit of the Exchange.

In all respects the Quebec Exchange enjoyed a most successful year during 1909. The prospects for the current year are viewed with much optimism. Preliminary arrangements were made for a banquet which will be held in the near future. Mr. J. G. Lafaivre is to be complimented upon the efficient manner in which he has discharged his secretarial duties.

Death of Mr. Randolph Macdonald

We regret to record the death of Mr. Randolph Macdonald, of the Randolph Macdonald Company, Limited.

Mr. Macdonald was born in Drummondville, March 30th, 1849, and was the son of the late Mr. A. P. Macdonald, who represented West Middlesex in the Dominion Parliament for a number of years. His connection with railways began early, and at the time of his death he was one of the best known railway contractors in Canada.

In 1870 he became a partner with his brother, under the firm name of W. E. Macdonald & Company. They built sections of the Intercolonial, sections 1 and 2 of the Lachine canal, and the Welland Basin, near Montreal, and the Fenelon Falls part of the Trent Valley canal.

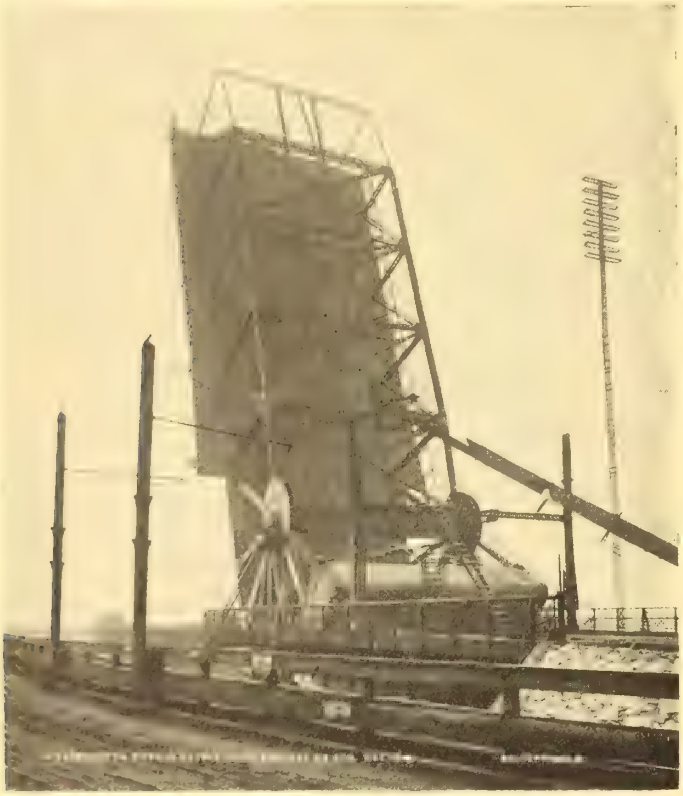
In 1887 Mr. Macdonald was awarded the Don improvement contract by the city of Toronto, and he continued this work in partnership with Alexander Manning, contractor and capitalist, under the partnership name of Manning & Macdonald. From 1891 to 1903 they built the Port Dalhousie harbor works, the Midland Division of the Grand Trunk to Campbellford, Ont., the Esplanade works of Toronto, the Canadian Pacific Railway section on the Don river, the Toronto Belt Line Railway, section 13 of the Soulanges canal at Coteau Landing, and section 9 at Coteau-du-Lac, these two sections costing $1,200,000, and the St. Lawrence river improvements at Cornwall. Mr. Macdonald purchased the Manning interests in the firm, and carried out a large contract at Three Rivers, Que., and other fairly big contracts.

The late Mr. Macdonald was 60 years of age. He is survived by his wife, a daughter and two sons. One of the latter is Mr. Wm. E. Macdonald, a member of the Macdonald Company, Limited.

New Bridges at Vancouver, B.C.

There is probably no better indication of the commercial development and prosperity of a city than the number and condition of its bridges. This, of course, does not apply to an inland town, where bridges are unnecessary; but to a city situated as Vancouver is, on both sides of an arm of the sea which practically divides the city into two parts, the subject of bridges is a most important one.

The first means of transport across False creek, Vancouver, was a rudely constructed raft of cedar logs, used by the early settlers whose business took them over the trail between Gas Town and New Westminster. Later on, when the Government constructed the Westminster Road, the present timber structure, which has spanned False creek at Westminster avenue for so many years, was built, and since then has served to carry the traffic between the business part of the city and Mount Pleasant. The next bridge to be built was the one at Granville street, and later on the present structure at Cambie street was erected. These were but rude beginnings when compared with the splendid steel and concrete structures recently completed by Messrs. Armstrong, Morrison & Company, contractors, but they served their purpose and at the time were considered a big undertaking.



New Westminster Avenue Bridge, Vancouver, B. C. —Bascule Raised.

The new bridge erected at Westminster avenue is something of a novelty in bridge construction for this part of the country, the draw being of the Bascule type instead of the ordinary swing span. Where this type of bridge can be built, it has a decided advantage over the other type, presenting, as it does, a free and uninterrupted channel for the passage of craft. It is also more quickly opened and closed than any other type. The new bridge at Granville street is a very handsome structure, consisting of 25 plate girder spans and a draw span, the latter being 265 feet in length and presenting two channels of about 90 feet in the clear.

The main piers of both of these bridges were sunk to bed rock by what is technically known as the pneumatic process, and are sufficiently deep to provide for the future deepening of False creek without in the least affecting their stability. This class of pier work was something entirely new in this part of the country, and necessitated an enormous quantity of plant and equipment, but notwithstanding this it was carried out by the contractors without a hitch, much to the satisfaction of the consulting engineers and the city authorities.

The principal dimensions of the bridges are as follows:

Granville street:

Length of steel work, feet	2,065
Total length, inclusive of approaches, feet	3,290
Number pedestal piers	50
Number pneumatic	4
Quantity of concrete, cubic yards	5,300
Number of barrels cement used	6,000
Total cost, about	$500,000
Weight of steel in superstructure, tons	2,375

Westminster avenue:

Length of steel work, feet	280
Number pneumatic piers	4
Number abutments	2
Quantity of concrete, cubic yards	2,000
Number barrels cement	2,300
Weight of steel, tons	500
Total cost, about	$180,000

It is a coincidence worthy of note that the old bridges at Granville and Cambie streets were both built under the supervision of Mr. W. H. Armstrong, now senior member of the firm of Armstrong, Morrison & Company, the contractors for the new steel structures.

One hundred and fifty employees of the Seaman, Kent Company, Limited, were entertained recently at the first annual banquet given by the firm. The representatives of the company and guests present included W. B. Seaman, J. M. Sparrow, J. D. Lowery, M. Rowland, G. Kastner, F. Kent, Major Cleland, Dr. Clarke, W. A. Moore, J. A. Simpson, J. A. Sinclair, etc., etc. The various items on the menu card were of a most delectable variety made up of such palatable courses as "Beaver brand salmon," "kiln-dried turkey," "bundled chicken," "selected white shavings," and so on. In the course of one of the addresses it was stated that 25,000 tons of freight had been shipped out of Meaford last year and that half of it issued from the works of the Seaman, Kent Company. The company is to be congratulated upon the success of the function and also upon the growing popularity of the "Beaver Brand" of hardwood flooring.

The C.P.R. claim that with the 1,760 miles added to the system during the past year it has taken the premier place for mileage amongst the railroads of this continent. The C.P.R. now has 10,048 miles of road in Canada and nearly 5,000 owned or controlled in the United States, making a total of 15,000 miles. This is nearly 3,000 miles more than its largest competitor in the United States, the New York Central, which between owned and controlled lines has 12,524 miles.

Bridge Frameing Problems—Wood vs. Steel

Some Surprising Achievements in Heavy Timber Framing, old and new — Advantages for certain kinds of Bridges

By J. B. Kidner.

It cannot fail to be of interest to know that there is at least one portion of Canada where the humble wood is still holding its own in a large measure as a constructive material.

The province of New Brunswick is entirely different in its physical conformation from many other parts of the country. Instead of vast plains stretching away for hundreds of miles, the face of the eastern province is broken up in every direction by hills and valleys, brooks and streams, lakes and rivers. As a consequence, bridges innumerable have to be provided on all the highways of the land and these are all in charge of the Provincial Government. The department of public works, with a staff of skilled engineers and designers, is kept busy with the construction and maintenance of bridges of all sizes and descriptions, varying from small bridges over creeks and streams up to huge spans of 300 feet and over.

In consequence of this demand, the matter of the best designs and materials for bridge work has been particularly studied by the government experts in charge of the public construction work of the province.

Formerly, of course, all the bridges were of wood, and many fine examples still remain to attest the skill and ingenuity of the bridge carpenters of a generation or so ago. Such a one as is shown in fig. 1, where wooden trusses of 240 feet span, resting on cribwork piers, are depicted, calls forth the admiration of all true lovers of craftsmanship. For it must be remembered that the problem of designing and constructing a wooden bridge of such a span was a vastly different task from that which confronts the modern designer of steel structures of similar size. With his formulas at hand to guide him, the modern draughtsman can go ahead and design his bridge with perfect confidence that the steel works can meet his every requirement in plate and girder, bar and bolt, rivet and pin.

But it was otherwise with the men who planned the old wooden structures, such as that shown in the illustration, whose first thought before putting a pencil to paper was as to what sort of timber could be obtained and in what lengths and sizes. Then came the problem of designing the joints; a matter which gave play to great skill on the part of the old engineers. For the points of failure in wood construction are almost always at the joints, which must [illegible] signed and properly divided with suitable fastenings of straps, bolts, etc.

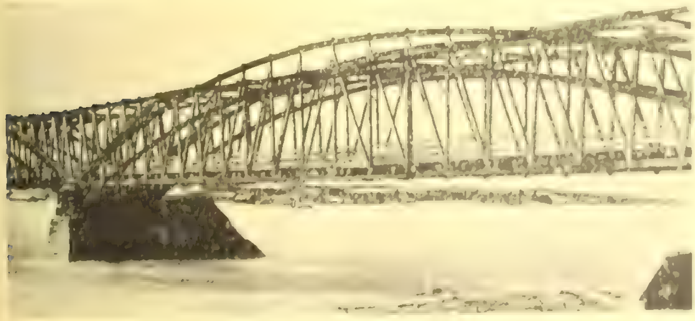


Fig. 1.—Wooden Truss of 240 feet span.

The second illustration is a view taken at the other end of the long bridge (over half a mile in length), where the wooden trusses of the first picture were taken. As will be seen, a modern steel bridge is being erected on granite piers, the steel being supported during construction on a temporary platform carried on piles driven in the river bed. This picture shows the contrast between a modern granite pier and an old cribwork one.

But while steel holds the field for large bridges, it is otherwise with those of small span. For some years after the introduction of mild steel in construction, the Government engineers built all their new bridges of that material, but for several years past that policy has been abandoned and for all spans up to 180 feet, wood has been resorted to once more.

A number of reasons have led to this re-adoption of wood, one of the most important being the great cost of maintenance of steel bridges. Every third year a steel bridge requires to be very thoroughly painted with a heavy coat of either the well known carbonized coating paint, or a graphite compound.

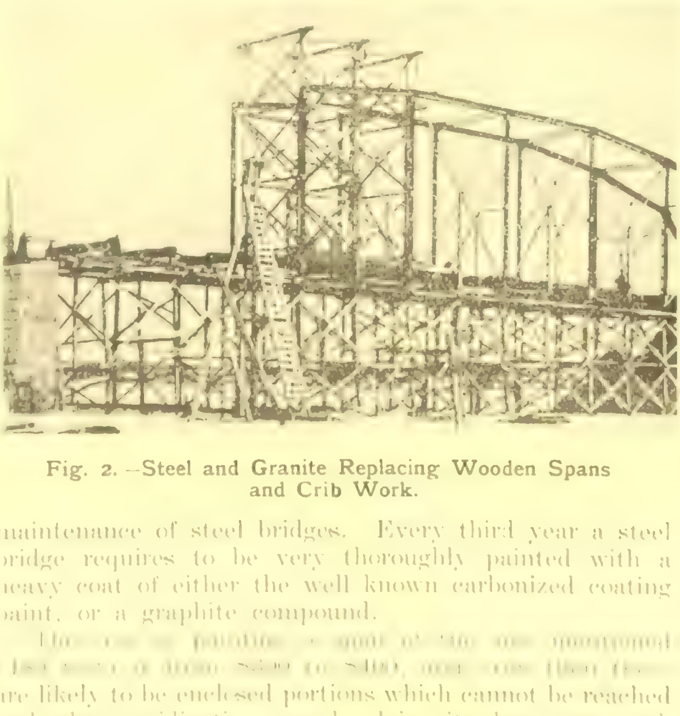


Fig. 2.—Steel and Granite Replacing Wooden Spans and Crib Work.

[illegible] are likely to be enclosed portions which cannot be reached and where oxilization may be doing its dangerous work [illegible]

[illegible] penny need ever be spent on paint, with the one exception of a coat of hot tar which is given the joints as they are put together in the first place. There is little [illegible] duration of the former as at least 100 years. Of course, during that period the cedar shingles of the roof would require renewing several times; the life of cedar shingles being only about 25 years. The modern steel shingles will, however, undoubtedly last much longer than those [illegible] in a century.

Another important question is that of the up-keep of the floor of the bridge. The usual floor is composed of a planking of hemlock overlaid with a top floor of hardwood, usually birch or maple. In the case of the small bridge, open to all weathers, it is invariably found that the hardwood upper flooring rots long before it wears out, and thus requires frequent renewal. But with the covered wooden bridge, the reverse is the case, and the hardwood flooring will wear down to the thinnest possible piece before showing any signs of rotting. On the question of the cost of maintenance then, the evidence is all in favor of the wooden as against the steel bridge.

But there is another consideration of great weight and that is that in many cases the cost of transportation of steel to the site of the structure would be enormous. Many bridges are necessarily in remote portions of the country, away from railroads and water carriage, while the forests all about afford endless supplies of timber on the spot. If no sawmill exists within reach, a portable mill is easily obtainable, and these, with the addition of a blacksmith's shop, will provide all the equipment necessary for carrying out the work. Fig. 3 is a view of a modern wooden bridge, the trusses being of the Howe type.

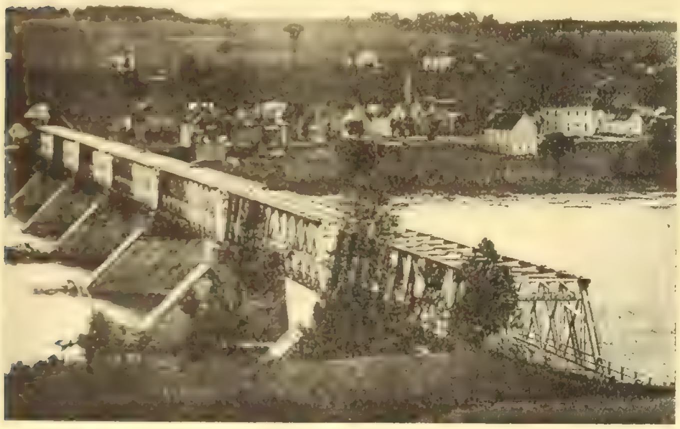


Fig. 3.—Typical Modern Wooden Bridge before being covered.

Municipal Improvement in the West

Many municipal improvements are being carried out in the cities of the west. The accompanying table shows that elevevn cities now have 640 miles of sidewalks, 345 miles of sewers, and 416 miles of water mains. In two years the increase has been respectively 31, 38 and 43 per cent.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

1917. Agents—A Scottish firm manufacturing fire bricks, sewerage pipes and all kinds of fire clay goods wishes to enter the Canadian market, and is prepared to appoint agents.

1921. Agent—A firm in the English midlands desires to appoint a Canadian agent for the sale of their gas, steam radiators and other heating apparatus.

1931. Pulleys and lifting tackle—A London firm manufacturing pulleys and lifting tackle is prepared to appoint Canadian resident representatives.

8. Sewage machinery, etc.—A firm in the English Midlands manufacturing all descriptions of sewage machinery, refuse destructors, steam disinfectors and general sanitary appliances, hydraulic tools, roofs, bridges, girders, engines, boilers hoists, pumps laundry machinery, etc., wishes to do business with actual users of such machinery in Canada.

M. G. McArthur, Guelph, is stated to be a candidate for the city engineer's office at Victoria, B.C., which is now vacant owing to the resignation of Mr. C. H. Topp.

City Clerk Littlejohn, of Toronto, who has been ailing in health for some time, has obtained two months' leave of absence and gone to Bermuda.

Toronto fire losses during 1909 totalled $740,932. The figures for 1908 were $1,073,990. The actual loss on buildings during 1909 was $283,585.

The mileage of railways in actual operation in Canada during the year 1909 was increased 1,138 miles, as compared with 514 miles in 1908, according to a blue book on railway statistics placed on the table of the Commons last week. 24,104 miles are now in operation in Canada.

The C. N. R. is planning important extensions radiating from Edmonton, Alta. Branches will run to Calgary, Peace River, Yellow Head Pass, the Pacific Coast and the prairie country. Work on the main line west will be rushed next season and supplies are now being sent forth. The company is preparing to build into the grand prairie country next summer and surveyors are now in the field running preliminary lines.

	Water Mains			Sewers			Sidewalks		
	1907 Miles.	1909 Miles.	P.C. Inc.	1907 Miles.	1909 Miles.	P.C. Inc.	1907 Miles.	1909 Miles.	P.C. Inc.
Brandon	16.35	19.35	18.8	14.00	16.77	19.8	26.	31.5	21.1
Calgary	26.7	48.5	77.9	19.00	44.00	131.5	19.	47.	142.0
Edmonton	32.30	41.34	28.0	24.97	41.87	68.0	46.2	57.05	11.3
Lethbridge	6.00	18.50	208.3	5.00	8.0	60.0	4.20	17.25	310.7
Medicine Hat	8.50	12.70	50.0	1.20	3.80	21.60	.....	5.38	.....
Moose Jaw	9.10	19.75	117.0	7.00	10.50	50.00	7.50	16.50	120.0
Portage la Prairie	9.00	11.00	22.2	9.00	11.00	22.2	15.79	21.00	31.00
Prince Albert	4.00	9.60	140.0	2.91	5.83	100.00	......	......	......
Regina	8.50	20.50	142.3	7.25	19.00	162.00	19.50	41.00	110.2
Saskatoon	.....	9.62	.....	2.00	9.62	381.00	3.00	10.46	248.6
Winnipeg	170.00	205.72	21.00	159.75	175.50	16.1	347.00	393.50	13.1
Totals and inc. P.C.	290.45	416.58	43.00	252.08	345.89	38.00	488.19	640.64	31.00

Estimating by a Reliable Uniform System

The Fourth of a Series of Practical Articles Designed to Illustrate the Advantages of Up-to-date Figuring—Plumber Work

Specially Contributed by W. M. Brown, C. E.

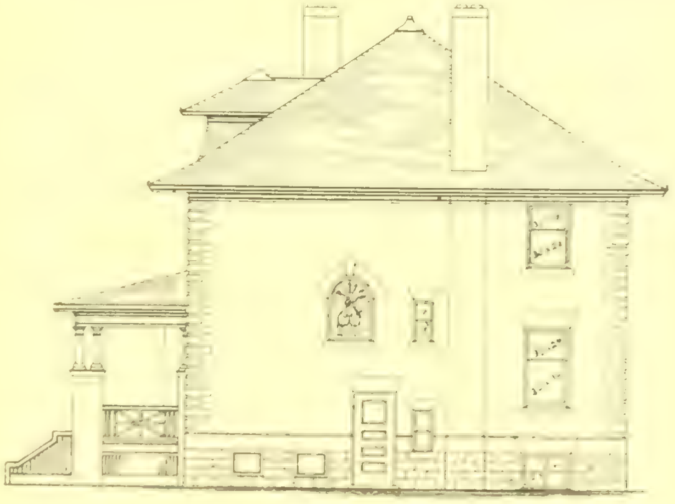
In measuring the plumber work we begin at the roof, taking note of the materials adopted for hip rafters, valley gutters, flushings and aprons at chimney stacks, rooflights, etc. It is the most natural way to commence at the roof material and outside work, as it is generally the first to be completed, before the internal fittings are finished or in operation. The class of material for the roof will be regulated by the various requirements for the proper protection of the property from fire, or from climatic or atmospheric influences. The cost to be expended will also regulate the class and quality of material to be utilized.

In this case the material is 12-inch galvanized iron for valleys, flushings around dormer, roofs over verandah and oriel, chimneys, etc., which are to be made thoroughly watertight, measure per lineal foot. Galvanized iron ridges measured per lineal foot, and charge finials price for each, describing same according to catalogue. Supply and place around eaves a 10-inch galvanized iron eavetrough, the lineal measurement to be taken, and allow for slips at joinings. Enumerate the raised corners, as per plan, and charge a price for each. Supply carpenter with 3-inch x 8-inch galvanized saddles for hips, charge price for each. Verandah, oriel and dormer roofs to have an 8-inch galvanized iron eavetrough, to be lineal measurement, and allow at slips as before. Enumerate and price raised corners as before. Supply carpenter with the necessary 3x8 galvanized saddles as before. Three-inch corrugated cast iron conductors from main roof, and 2-inch corrugated cast iron conductors from verandah, oriel, and dormer roofs, to be measured and priced per lineal foot. The whole of the above galvanized iron work to be done in the best manner, with the best quality gauge galvanized iron, to have all cross seams well rivetted, and the whole thoroughly soldered.

After all the exterior work has been noted down, then we take all the internal pipes and fittings. The cold supply from the main should be measured first, taking generally from the centre of the road or street, to the house, and led up through the apartments, where the water closet, bath, sinks and hot water tank are fitted up in their respective places. There may be more pipe required for one house than another of the same dimensions and character; for owing to the different arrangements of the apartments where the fittings are situated, the main supply and soil pipes, etc., may require greater lengths than what would be adequate for a more convenient arrangement. The supply pipes to bathroom and hot water tank may be greater in length in some cases than others, owing to the distances to travel between the hot water tank and bath and wash hand basin. The arrangements are dependent upon the architect's plans, and it is for the plumber to use his practical knowledge in adopting the nearest method possible of leading his pipes that will be consistent with the best sanitary requirements and efficiency. The following are the pipes and fittings, with their connections as specified:

Soil Pipe—Soil pipe to be 4-inch in diameter, sound and free from flaws or other defects, to be of a uniform thickness of at least one-quarter of an inch, and coated with coal oil; the soil pipe to be continued as straight as possible through the roof, the full [illegible] at least [illegible] feet above the roof, and connected to a 4-inch vitrified tile drain outside of building, and to be provided with a brass ferrule and caps for cleaning. All joints to be properly caulked with oakum and molten lead, joints between cast iron and lead pipes to be made with brass ferrule and wiped joints. Wherever soil pipe passes through roof, a watertight joint to be made, providing a flashing of sheet lead of the proper size for around same. All changes in direction of soil pipe to be by bends, and all branches to be Y branches. Iron soil pipe to be supported with strong hooks and hangers, as the case may require. After completion of soil pipe, and before any fixtures are attached, all openings in waste or vent pipes to be plugged, and the whole system filled with water and allowed to stand for 24 hours to test pipes.

In measuring soil pipe take the shortest method of travel, not down length, allowing for slips and charge per lineal foot; also keep traps, ferrules and wiped joints separate, and charge same price for each respectively.



East Elevation

Boiler—Supply and place in kitchen where directed on proper cast iron stand, one galvanized iron range boiler of 35-gallon capacity, with the necessary connections to range and to system, and leave same coupled. In measuring this, take price of boiler separate, then the connecting pipes per lineal foot, couplings at connecting price each. Hot and cold water taps to be [illegible]

Water Closet—Supply and place in bathroom, one syphon jet closet combination, golden oak finish, push button, flush properly connect in place and supply with ½-inch water supply. In measuring this, take water closet separate price. Measure then supply or service pipe to closet from cistern, charge any bends, couplings, or wiped joints separate price each.

Bath—Supply and place in bathroom, one first quality enamelled iron bath, 5 feet 6 inches long, with 3-inch roll rim, nickel plated fuller taps for hot and cold [illegible] waste and overflow, [illegible] and [illegible] [illegible] connected to soil pipe [illegible] and centrifugal bath trap, and supply with hot and cold water. In measuring this charge for bath a piece. Take the different pipes connected therewith per lineal foot and price. Charge taps for hot and cold water separately (each), also plug and chain, and centrifugal bath trap as specified.

Lavatory—Supply and place one enamelled iron lavatory with 8-inch back, with plug and chain, nickel plated fuller taps for hot and cold water, nickel plated centrifugal trap, waste and supply pipes, all to be properly supported and connected to soil pipe with 1½-inch lead waste pipe. In measuring this, note down all the separate details, and price in a similar manner as described for bath.

Sink—Supply and place one enamelled iron sink, 16-inch x 24-inch, properly supported on iron brackets with holes to secure wood run to, to be supplied with hot and cold water in ½-inch water service, fuller taps, 1½-inch lead waste pipe and centrifugal trap with break syphon vent, all properly connected to soil pipe.

In measuring this, note down all the separate details, and price in a similar manner as described for lavatory.

Laundry—Supplying and fitting up two division laundry tubs, supplied with hot and cold water, fuller taps, and to have break syphon trapped waste, properly connected to soil pipe. Provide 2-inch trapped connection with strainer cover to soil pipe in floor near laundry tubs.

In measuring this, note down all the separate details, and price in a similar manner as described for sink.

Water—Bring water from street line in ½-inch galvanized iron pipe, putting in a lawn hydrant with stop and waste where required, and conect to the system; supplying heavy stop and waste cocks for turning off, the whole of the exposed pipe work to be nickel plated, all other water pipe work to be galvanized iron, all waste pipes to be of cast iron or lead, and all connected together in the best and most workmanlike manner.

In measuring this, take each item separately and price at current rates.

Advantages of the Uniform System in this Department

In contracts where lead, copper, or other heavy material are adopted for the roof work, then certain allowances would be given which might be overlooked in framing the estimate in a loose and haphazard manner. In the case of lead, copper or zinc, all overlaps are taken and added to the length. All straps or "clips" securing ridges or hip rafters to be enumerated and priced each. All ornamental ears of outside conductors, and lead or galvanized iron ears securing service pipes at closets, to be enumerated and priced.

All wiped joints on lead pipes to be enumerated and priced. All bends formed on lead soil and waste pipes to be enumerated and priced. The iron eave gutters to be measured to extreme points both ways, and extra to be charged for angle pieces according to class, such as right angles, obtuse angles, acute angles, or specially made angles, and to be described as such and priced. All lead, copper or other material formed to any uncommon or elaborate shape, to be described and priced as such for extra labor entailed. The prices will be regulated in a great measure according to the kind of contract to be done, its convenience and facility of execution, and the degree of high-class finish adopted.

An Ottawa painter, named John Preston, came into a legacy of $50,000 last week, upon the death of his god-father in England.

Trade News from Montreal

No Serious Losses from Frank Gilbert's Assignment — The Ice Palace Contractor's Problems

Montreal Office of the "Contract Record."
January 24th, 1910.

The assignment of Mr. Frank Gilbert, of Westmount, was announced at the latter end of the week. Mr. Gilbert was well known through the extensive dredging operations he was engaged in, and the news of his failure comes as a surprise. From the statement issued it is apparent that his creditors were not heavily involved, the liabilities being announced at $66,036, with assets of $62,960, plus a third interest in a claim against the Government.

John Murison's Failure

The winding up of the estate of Mr. John Murison, the Montreal contractor who assigned a short time ago, is being proceeded with. The liabilities are announced at $150,000, with assets of about $80,000.

Mr. Murison left unfinished a number of contracts, including the erection of Point St. Charles' Congregational Church, four houses, and three National Transcontinental Railway contracts. He was interested in a plumbing business in Westmount and owned a stone quarry in Outremont. Insufficient capitalization to carry out his different projects seems to have been responsible for his failure.

Modern Paving Company Take Action

Messrs. R. Brunet and E. Belanger, of the Modern Paving Company, have each entered an action for $10,000 damages against Mr. J. H. Anderson, who a short time ago petitioned for a judgment for seizure of their funds in the Banque Nationale, and later for an order to liquidate their business. The actions allege injury to their business due to the course pursued by defendant.

The LaPrairie Brick Company, Limited, have increased their capital stock from $300,000 to $1,000,000.

Local Firm's Great Rock Crusher

The largest rock crusher in the world will be one of the features of interest at the rock crushing plant which Messrs. Laurin & Leitch, the well known Montreal firm of contractors, will have in operation at Outremont within a few months. They have contracted with the Montreal Water & Power Company to build a reservoir about 800 feet long and 400 feet wide on the side of the mountain, and as the contract must be completed within four years, one of the problems involved was the economic disposal of the rock which is to be excavated. In view of the large and increasing demand for crushed stone for concrete and other purposes, they decided to erect a plant of sufficient capacity to take care of all the rock which might accumulate during the progress of the work. Having visited the largest and most modern crushing plants in the United States, especially in New York and Michigan, Messrs. Laurin & Leitch selected the Gates gyratory breakers as those best suited to their requirements, and gave to Allis-Chalmers-Bullock, Limited, the contract for the complete equipment. It will involve an expenditure of upwards of $200,000.

Another serious problem was to arrange a plant of such proportions on the land available in that locality. Messrs. Laurin & Leitch purchased a site about 1,000 feet away from the reservoir and have arranged for direct connections with both the electric railway and the

C.P.R., while the quarry cars will be hauled along two incline railways from the reservoir to the edge of the crushing plant property. There will be a powerful hoisting engine capable of lowering four cars, each carrying 20,000 pounds in one train over the incline of 1,000 feet, at the rate of 250 feet a minute. The incline will be operated with two barneys, so that, if desired, an additional train of rock may be elevated to the crusher plant without letting the empties down as the barneys carry the rope back. By this method no coupling or uncoupling of trains will be necessary. Two additional hoists will operate separately, each taking one of these loaded cars at a time, elevating it to the crusher, and, after it is dumped, lowering it to the bottom of the incline again. Steam shovels will be used for loading the quarry cars.

The principal rock crusher, known as a No. 21, weighs 240 tons and has a capacity of 10,000 tons in ten hours, or about 500 railway car loads daily. This machine receives the largest pieces which it is practicable to take from a quarry and crushes them without the need of any preliminary breaking by sledge, hammer or secondary blasting. There are two discharge openings through which the crushed product leaves the machine, instead of only one which is usual with smaller breakers. It is thus possible to build the machine lower and make it more stable. The broken rock from each spout will fall into large steel frame elevators, which in turn, wil deliver it into heavy steel frame screens, each 6 feet wide and 22 feet long, with 2¾-inch perforations. The rock which escapes this mesh will be conveyed to several of the No. 6 Gates breakers, equipped similarly, though on a smaller scale, with elevators and screens. To care for such an enormous amount of stone daily there will be a carefully planned system of storage piles and bins, while the tracks will be arranged in such a way that crushed stone can be loaded by steam shovels into either railway cars or horse carts.

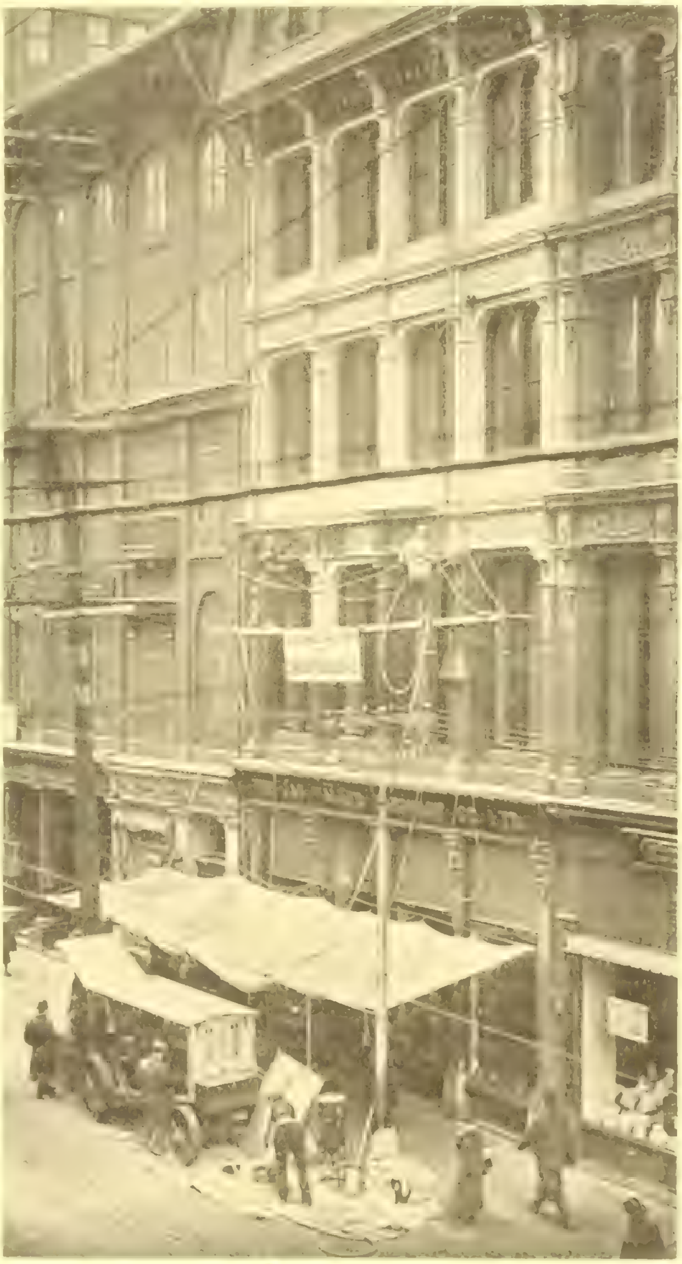
Having purchased the largest rock breaker in the world, Messrs. Laurin & Leitch determined that the rest of the equipment should be of the most modern character. The entire plant will be driven by a 700 h.p. triple expansion engine, and a cooling tower will be erected so that the engine may run condensing. Electric power will be used whenever it is advantageous, and the firm will have their own electric plant, consisting of a 175 k.w. alternating current generator belted to the main shaft of the engine, switchboard, transformers and other apparatus. The smaller breakers, elevators and conveyors will be run by induction motors. Even the rock drills will be operated by electric power. When completed the plant will be the largest of the kind in Canada. Allis-Chalmers-Bullock, Limited, will act as consulting engineers in connection with the erection and operation of the plant.

Interesting Sand Cleaning Process

The operations of the Canadian Sand Blast Company at the corner of McGill and St. James streets during the past week, have been watched by continuous throngs of interested spectators. This company have the contract for cleaning and renewing the sand stone fronts on several of the older business buildings on the important thoroughfare and are employing methods entirely new in Canada.

The plant and equipment used by the company is quite neat and compact and has the advantage of being readily portable, allowing transference from point to point as required.

The machinery consists of an Abenaque air compressor, direct connected to a 10 h.p. gasoline engine. These are mounted in line on steel beams and connected by large spur gears of such size as to allow both engine and compressor to run at their most efficient speeds. The air receiver and gasoline tank are located under the beam and the unit is entirely self contained. The compressed air is connected in turn to a Buckeye sand blast machine and a very sharp and gritty sand is employed for the cleaning process.



Sand Blast Cleaning by a New Principle.

An idea of the remarkable force obtained by forcing the air-driven sand against the building can be observed from the accompanying photograph which shows the Canadian Sand Blast Company at work on St. James street, one of their first contracts. In the picture may be noted the canvas arrangement to catch the sand as it falls from the building, practically no inconvenience being felt by the public even on this busy thoroughfare, as a result of this protection. The workmen are themselves specially garbed and well protected against the flying sand particles.

[illegible] portable [illegible] air compresser unit and the [illegible] sand blast were supplied by the well known [illegible] Limited, of this city, Canadian sales agents for these machines. Mr. Colby, the manager for the Canadian Sand Blast Company, has made contracts for renewing several of the down town buildings, and already the old section of the Queen's Hotel building and several of the C.P.R. sheds have been cleased by [illegible]

Progress on the Ice Palace

The work of Messrs. Corriveau & Brunett, contractors for the erection of an ice palace for the Montreal Carnival Committee, has been proceeded with during the past two weeks under the greatest of difficulties. The weather during that period has continued mild, and extremely so during the last week, making their task doubly difficult.

A staging was erected close to the car tracks to facilitate the unloading from the flat cars supplied by the Street Railway Company, but objection was taken to the entailed delay to the passenger traffic, and this method had to be abandoned and the ice roughly rolled from the cars with the assistance of all the workmen.

The first ice, supplied from the Back river, was of very poor quality, and it is feared that the foundation work made with this ice may not prove satisfactory and durable.

The contractors have also had trouble with their staff of workmen, finding it difficult to keep their night gangs on hand. The element of danger entered into the work, due to the misty rain, rendering footholds insecure. This difficulty was partly overcome by supplying the workmen with new rubbers.

In the face of their numerous troubles, the contractors have made excellent progress and expect to have the work nearly completed on time. At the present time two derricks are employed in raising the ice for the central tower, which will be 90 feet above the ground level.

Items of Interest

Mr. Kenneth G. Rae, architect, Beaver Hall Hill, has returned from Europe after spending a month on the Continent.

Congratulations to Architect J. Z. Resther, re-elected alderman by acclamation for Centre Ward.

The students of the Faculty of Applied Science, McGill University, are appreciating Mr. G. W. Cowie's series of lectures on Harbor Engineering. Upwards of 100 are taking the course delivered by the chief engineer of the harbor commission.

Mr. Dakers Cameron, B.A., has resigned the secretaryship of the Montreal branch of the Canadian Manufacturers' Association.

Mr. H. W. Weller, of Montreal, manager of Babcock & Wilcox, Limited, was in Winnipeg recently and signed an important contract with the Winnipeg Electric Company for the supply of boilers required for an auxiliary steam plant to be nstalled in that city. It is estimated that the boilers will cost $35,000.

It is reported that the John McDougall Caledonian Iron Works Company, Limited, will erect their recently destroyed foundry building in Three Rivers, Que., in lieu of again building in Montreal.

Mr. Patrick McGovern, of Boston, the contractor for the Montreal conduit, has presented the water committee with an account of $12,229 for supplementary work in connection with his contract.

New President of the R. A. I. C.

Mr. A. F. Dunlop, R.C.A., of Montreal, who was president of the Royal Architectural Institute of Canada, recently resigned from this position, which he had held for two years. At a meeting of the executive council of the Institute at Montreal, on the 18th inst., Mr. F. S Baker, F.R.I.B.A., of Toronto, was elected president to fill the vacancy.

While the Institute will regret the loss of Mr. Dunlop, the resignation of this gentleman was not entirely unexpected, and we venture to think that the election of Mr. F. S. Baker, who is well known, and popular in the profession, is a wise choice.

Mr. F. S. Baker, Toronto, who has been elected President of the R. A. I. C.

Mr. Dunlop expects to be absent on the Continent during the greater part of the current year.

Nineteenth Annual Meeting of the P.Q.A.A.

The nineteenth annual meeting of the Province of Quebec Association of Architects took place at the City Hall, Quebec. The report of the council, and also that of the treasurer, were presented, and were of a most satisfactory nature. The election of officers also took place and a number of other matters were settled. The visitors were tendered a banquet at the Chateau Frontenac. At this function, honor was paid to Mr. F. X. Berlinguet, who has just passed the 60th anniversary of his practice as an architect.

Among those present at the banquet were the following: Sir Francois Langelier, Hon. J. C. Kaine, Messrs. T. Raymond, Maxwell, J. S. Archibald, J. R. Gardner, A. R. Decary, David Brown, E. Resther (retiring president), C. S. Burgess, H. Vallance, Jos. Venner, J. P. Ouellette, R. P. Lemay, G. E. Tanguay, L. E. Auger and W. D. Baillairge.

The officers elected were as follows: President, Thomas Raymond, Quebec; 1st Vice-President, J. R. Gardiner, Montreal; 2nd Vice-President, L. Lemieux, Montreal; Treasurer, W. Maxwell, Montreal; Secretary, J. E. Vannier. Council: J. Z. Resther, Montreal; J. Venne, Montreal; H. Vallance, Montreal; Jos. P. Ouellette, Quebec; G. A. Monette, Montreal, and K. G. Rea, Montreal.

Possibilities of Cement as a Road Material

Mixing Cement with Asphaltic Base Oils Lessons Obtained from a Study of the Roman Roads Suggested Improvements

Lime-cement concrete is the oldest road material that we have any record of. The Roman roads, which were of this type of construction, are the only ones which have endured for any great length of time. The Appian Way, which is undoubtedly the best type of Roman road, was begun by Appius Claudius, 312 B.C., and parts of it are in a remarkably good state of preservation to-day. We know perfectly well that any of our modern Portland cements are far superior in strength and durability to the lime mortar used by the Romans, and yet I have never seen a road built of Portland cement concrete that I considered altogether a success. There are two characteristics of Portland cement concrete which in my opinion bring about the failure of roads constructed of it. The first is the tendency of concrete, where exposed as in a road surface, to develop shrinkage cracks. These cracks are generally parallel to the road, and increase in size as time goes on. The second characteristic which brings about failure is the ease with which concrete spalls along the margins of cracks. I have never seen a concrete road fail through what I thought was due to expansion, but it is the general practice to place expansion joints at right angles to the line of concrete roads at frequent intervals, and the road suffers from much spalling at these joints.

It is perfectly apparent to anyone who has made a study of the subject that there could b eno better form of road construction, at so low a cost, to meet only automobile traffic conditions than a cement macadam road. The most durable types of rock could be used as an aggregate, which would give maximum life to the road, and it would be practically dustless. So apparent is this, that in the endeavor to use Portland cement in road construction much ingenuity and refinement have been resorted to, but with the exception of a few isolated cases, real success has not been attained.

It might be appropriately asked: Why have the Roman roads stood varying conditions for so many centuries? I believe that a consideration of this point might be helpful in meeting our present conditions.

In the construction of Roman roads of the best type, a trench about 3 feet deep was excavated the entire width of the road, and wherever poor material was present it was removed and replaced by suitable material, and the whole subgrade was thoroughly compacted by ramming. Generally four distinct layers were placed in these roads. The bottom course, or statumen, was composed of two courses of stones placed in lime mortar. On top of this was placed th crudus or rubble, which consisted either of broken stone or, when available, broken bricks, potsherds, etc. When the latter composed the aggregate, more lime was used in the proportion of 2 to 5. This course was very thoroughly rammed, and was usually about 9 inches thick. The third course, or nucleus, was composed of old building material, such as brickbats, broken tiles, etc., mixed with lime in proportion of 1 to 3. This course was not rammed and the sand was mixed hot. Above this course came the top or wearing surface, called the summa crusta, which was made of blocks of flat stone set in mortar and fitted together with great refinement. It can be seen that the third layer, or nucleus, was much softer than any of the others, and was placed purposely below the top layer, which was designe dto take the wear of traffic.

This type of road was undoubtedly the result of much experience. There are four distinct features which I consider worthy of the fullest consideration. First, an absolutely secure foundation was always obtained; second, a resilient or cushion layer was placed just beneath the wearing surface; third, the four layers composing the road had different coefficients of expansion, which would probably preclude the development of definite lines of stress brought about by contraction; fourth, the exposed or wearing surface was composed of a material which would not only withstand the wear of traffic, but atmospheric conditions as well.

We frequently hear the statement that the Roman method of road building is a lost art, and that we cannot build roads to-day of a similar character. This is altogether a mistake. We could not only build similar roads, but roads which, under the same conditions, would be more durable. A road of the Roman type under modern city traffic conditions would last only a few years, and would probably cost $250,000 a mile to build. The traffic they were subjected to consisted of light vehicles and unshod horses, and the fact that unshod horses were used leads one to believe that an earth cushion was probably maintained on the surface of these roads, as otherwise a horse woul dgo lame after 50 or 60 miles of travel. The portions of Roman road sthat we find intact to-day are those which have either been subjected to very light traffic or have been completely covered up with earth for long periods of time. In most cases we find only portions of the foundations.

The nearest approach we have to the Roman road to-day is the best type of paving brick, laid on a concrete foundation with a 2-inch sand cushion, and this type of road suits automobile traffic admirably, but is very hard on the feet of horses. As far as I have observed the concrete foundations, both for brick pavements and asphalt streets, rarely crack except from faulty foundations. The contraction cracks, therefor, I believe, are due to no fault in the cement, but to the great range of temperature to which the road surface is subjected, and the fact that it is generally laid during th ewarmest season of the year, when expansion is greatest. This view is further upheld when one considers that concrete floors and pavements laid on earth foundations inside of buildings rarely crack.

Whether this view of the matter is correct or not we know that concrete roads at present are not satisfactory, and our next consideration is whether they can be made so. Concrete has been almost universally adopted as a foundation for almost all types of heavy traffic pavements. It gives perfect satisfaction when protected from direct exposure, and whether methods of construction, or treatment, can be devised by which concrete can be used as a wearing surface for roads is a matter for investigation.

It is my belief that in most concrete roads the concrete is too uniformly mixed and too homogeneous in composition. This may account in a measure for the development of shrinkage cracks, where the surface is

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* A paper read before the Association of American Portland Cement Manufacturers by Logan Waller Page, Director of the Office of Public Roads.

[illegible] to a great range of temperature. Concrete is also too unyielding to the blows of traffic and too brittle, both of which characteristics facilitate spalling. It seems to me that a pavement can be made which, to some extent, will obviate these undesirable characteristics, and I would suggest the following general specifications:

About 6 inches of No. 1 broken stone mixed with the screenings below one-half-inch, thoroughly rolled with a steam roller as a foundation course. On top of this, spread a uniform layer about one inch in thickness of rather dry cement sand mortar. Over this course of mortar at once spread about three inches of No. 2 stone which should immediately be rolled with a steam roller until the cement sand mortar rises flush with the surface. Such a road as this, I believe, would have many advantages. It could be opened to traffic within a short time after completion; it would not be as rigid as an ordinarily mixed concrete road. I do not believe it would be as likely to crack as ordinary concrete, as the stones forming the aggregate would rest firmly upon each other, receiving the blows of traffic, and the cement mortar only acting as a binding matrix. Further than this there would be a minimum amount of cement used, and no two horizontal sections of such a road would have the same coefficient of expansion. Rock of the very highest resistance to wear could be used without any consideration of its natural binding power, which is so important in the ordinary macadam road. Another most important feature of this type of construction would be the absence of dust on the surface, which is so much sought after by highway engineers at the present time. It would also give an excellent surface, not too slippery nor too noisy. Most important of all, however, such a road would not cost more than 10 or 15 cents per square yard more than ordinary macadam, which is about the annual cost of spreading bituminous dust preventives.

I have mentioned this type of construction as a possible cheap method of using concrete in road building. Another way of approaching the problem is to treat Portland cement so that its brittleness will be reduced and its resilience increased. This, I believe, would be of great advantage, even if in so doing the tensile strength was greatly lessened. It can be seen that a material like asphalt, which meets so successfully the wear of traffic, is of a semiplastic nature, with very low tensile strength and no elastic limit. Alone, a slight blow will permanently deform it. Its adhesiveness to mineral matter, however, permits its being tempered by a mineral aggregate to the desired consistency. It is also known that the addition of Portland cement to asphalt surface mixtures is very desirable.

With these points in view, an investigation has been begun to ascertain the practicability of mixing semi-asphalt base ols with Portland cement concrete, with the object of obtaining the desirable properties of both the cement and asphalt. Up to the present time, our results have been somewhat encouraging. We have succeeded in making mixtures of as high as 20 per cent. of oil, and both the 7 and 28-day tests for toughness and tensile strength showed a regular increase. Briquettes with 5 per cent. additions of oil broke in tension at 230 pounds after 7 days in soak, and 296 pounds after 28 days; with 10 per cent. oil, 228 pounds after 28 days; with 15 per cent., 246 pounds; and with 20 per cent., 203 pounds. The results obtained under impact were practically parallel with those under tension. Increased proportions of oil retarded both the initial and final set in increasing amounts; the tensile strength and toughness were also reduced, but not in like proportions. It has been shown that concrete immersed or mixed with animal and vegetable oils disintegrates and, of course, this may be the case with petroleum. It is my intention to continue this investigation until the several points under consideration have definitely been settled. I might mention further that parallel tests were made with tar and cement, but the results were practically all negative.

If it is found that cement can be mixed with asphaltic base oils, and increased toughness obtained, I believe that the value of cement as a road-building material will be very much increased. The matter of mixing the oil is very simple, and can be conducted in any ordinary concrete mixer. All that is necessary is that the cement be thoroughly wet before the oil is added. On account of the lime present the oil quickly emulsifies and is evenly distributed. It has been suggested that the addition of hydrated lime would permit of larger proportions of oil, which I believe will prove to be the case. I further believe that concrete mixed in this way will be impervious to water.

While a laboratory investigation of this nature is very interesting and instructive, yet no final results can be obtained until an actual service test is made, and it is my earnest hope that in the near future I may be able to make satisfactory arrangements for one or more co-operative service tests.

Prospects of Western Canada

Second Vice-President Whyte, of the Canadian Pacific Railway, recently made the following statement with reference to the general prospects of Western Canada in 1910:

"The area under crop in Manitoba will not be largely increased in 1910, but in Saskatchewan the increase will amount to 20 per cent. Within a short time the Province of Saskatchewan will produce more wheat than any State in the American union, and within a few years it will produce more wheat than all the American States combined.

"In Winnipeg, more building will be done in 1910 than in any previous year in the history of the city. What is to be done in Winnipeg in this regard is the keynote of what will be done in all parts of the western provinces. The Canadian Pacific completed a very large amount of work during 1909 and there will be no cessation in the activities of the company in this matter in 1910. The list of extensions and improvements has been prepared, but it is impossible to state specifically what will be done until the matter has been submitted to the president.

"The investment of British and American capital in these provinces continues very large and there will be no cessation in the flow in 1910. Any proposition from western Canada which has merit can secure capital in Great Britain. It is essential that the project should have merit, but if it has merit the capital will be forthcoming.

"The immense sums of money paid to western farmers during the year 1909 must attract wide attention. From figures which have been prepared with great care I have learned that there were under crop in the three western provinces this year 6,922,000 acres, from which there were harvested 122,000,000 bushels of wheat. The average price actually received by the farmer for his wheat is estimated at 87 cents. The actual value of the crop to the farmer was thus $106,445,000. In oats there were sown 3,920,000 acres, producing 176,000,000 bushels. The average price received by the farmer for oats sold was 27 cents, making the value of the crop $9,309,000. The yield of flax was small, only 3,600,000 bushels, but the price was high, $1.35 per bushel, a total value to the farmer of $5,000,000. The total value of these crops to the farmers of the three prairie provinces was thus $168,000,000."

Architectural Education in Canada

An Interesting Paper Read by Professor Nobbs, of Montreal, at the Recent Convention of the Ontario Association of Architects

Mr. Chairman and Gentlemen,—Of the many kindnesses and encouragements I have received at your hands, your president's request to me to speak on "Architectural Education in Canada" is the greatest compliment. I assume it is not an historic retrospect that you desire of me, but rather a statement of what I consider may be done in this field of activity to-day, with some reference to what we should aim at on the morrow, that was implied by the addition of the words "in Canada" to the phrase "Architectural Education"; for architectural education among us is just beginning and it is a good time now to consider whether the foundations we are laying are adequate to their future loads. To save your time, and mine, I shall adopt a somewhat dogmatic method of exposition, which I trust will have the incidental result of bringing out some criticism and discussion. I knew there is another side to all the aspects of the questions with which I shall deal, and I have the deepest respect for the views of my most direct opponents. What I feel is not so much that we of the Unacademic School misunderstand our Academic friends, as that they are uninformed about our principles. This opportunity is therefore doubly welcome to me.

I shall try to divide the question before us into two parts, (1) College work, and (2) Outside influences. I use the word "outside" advisedly, for I am here I know in virtue of my post at McGill University.

To begin with, I suppose we are all agreed that it is desirable that every professional man should take a college course if he can afford it, an ordinary Arts course if possible. As very few can afford that luxury of time and money, the next best thing is to devise university work in connection with professional study. Of course there are lots of people about a university who can say a good deal to prove that technical and professional training is essentially different from, and of no service to, general culture; and there are lots of professional people who are quite eloquent on the uselessness of theoretical training in comparison with what they call practical work. Still, the compromise has much to be said for it. It all depends, like the cherry, on the spirit in which it is offered. Now, a "School of Art," as the term is understood to-day, is a different thing from a "Department of Architecture" at a self-respecting university, and yet the department of architecture has to do some school of art work.

By a school of art we mean a place where young people (for the most part of inferior education, I am sorry to say), are taught to be very skilful at drawing in various media, charcoal, water color, oil paint, and at modelling in clay and wax and at designing imaginary buildings and representing their intentions in black and white; a school of art is, in fact, a place where people learn a good deal of slight of hand and slight of eye, and very little about things in general, past, present and yet to be.

Now, of course, we all know that one cannot either study, gain experience in or achieve architecture to-day without great skill in drawing, and this takes an unconscionable time to acquire. Some departments of architecture at American universities try to be just schools of art in this sense, and I think their success as schools of architecture is in inverse ratio to their success as mere schools of art. The public, alas, understands by the word art just drawing, and I have used the word so far in this narrow and vulgar sense.

The school of architecture should [illegible] performance in draughtsmanship of those who come to it to study; its teaching must, of necessity, be largely conducted through the medium of drawing and its graduates should incidentally go out far better draughtsmen than they went in, but it is no part of its business to teach drawing as a thing in itself, or to teach anything by drawing which can be taught in a more rapid way by other methods. The graduate must be turned out ready to be a useful office hand, but the success of the school is not to be gauged by the good office hands it turns out, but by the progress of these good office hands to positions of trust and responsibility and independence after leaving college. Design, and not drawing, is the main end of such a department. Those things which tell in later life when a man begins to think for himself are what the school of architecture has to do with. Drawing is a matter for the school of art and the office to teach.

Perhaps I have laboured this point unnecessarily, but the good of the art must be thought of apart from the good of the existing members of the profession when we talk of education. Cultivated gentlemen cannot be produced except by accident, by a system which prides itself of teaching all that an architect need know "par le crayon,"—by the pencil. This question of drawing being disposed of for the present, let us consider the branches of study in an Architectural Department of a University. They are six in number:

(a) Design; (b) Aesthetic; (c) Archaeology; (d) Science; (e) Construction; (f) Professional Practice.

Design can, of course, only be taught "by the pencil," and I am of opinion also that it should only be taught by people engaged in the active practice of their profession, and that it is an honor to be allowed to teach it. In this I concur most heartily with the official views of the A. I. A. Also there is only one best way of running design classes, and that is by the accepted Beaux Arts method of sketches done without assistance, elaborated under criticism and guidance. At the beginning, frequent subjects, though they result in nothing that can be exhibited to passing strangers and give the teacher much to ponder over, lead, I think, to more rapid progress than the elaboration of what must of necessity be poor designs. It is practice in getting ideas together and knocking them into shape that a school of architecture can give. Time enough will be found in offices to learn to make a complete set of drawings.

Æsthetic may sound rather a portentous word, but it is useful as including the theoretic studies which may with advantage be associated with work in design. The elements of architecture, the theory of design and theory of planning, and, I think, ornament and decoration (if the arts of the ornamentalist are considered in relation to material and [illegible]) may be grouped under this head. A sketch of my courses in these subjects will develop the view I take, so I must ask your indulgence while I explain what is after all a personal matter of opinion and prejudice.

[illegible] be understood and historical examples be appreciated. Then [illegible] solids and features to consider. By the principles of composition, the chief of which is unity, something can be taught of the instinct whereby all these abstract, physical and material elements can be composed in one thing, revealing meaning and emotion, through mere sensuous beauty of line, form, mass and color. That is what I mean by the elements of architecture.

The theory of design may be taken to mean the first principles of art and their application to practical design. The senses, the phenomena of pleasure and pain and expression explain the art impulse. Beauty and its relation to the arts through subject matter, emotional content and physical media affords a basis of appreciation and criticism. Pure design in nature and in art and ornament, with its moral or significant aspect and its material logic, throw light on the evolution of architectural form. Such matters are in the domain of philosophy.

The theory of planning affords practice in methodical thinking—dimensions, arrangement, scales, aspect, prospect are common considerations for all problems. The study of domestic art illustrates the evolution from simple cottages to complex mansions of what is after all one organism—the house. Ecclesiastical art shows small differences of use affecting vitally the layout of typical examples within one class of problems. Libraries, fire stations, hosptials and the like show extreme specialization of type, while public buildings on analysis afford good illustration of various nationalistic sentiments expressing themselves almost independently of use and purpose. These subjects afford valuable side lights on the work of the design classes.

Archæology as an architectural subject may be shorn of much of the connotation of Hitites and Babylonian Captivities with which recent research has invested it. The traditions of our civilization, however, involve some study of the buildings of the Biblical peoples as well as the Greeks and the Romans. Mediaeval France and England have a very special bearing on ourselves, for it was through these countries that Italian art comes to us. France, never as long as she had any connection with this land, quite lost the mystery of her Gothic period, while England in her most classic phases has always retained something of the patent honesty of design which culminated in the 14th century But, perhaps, things being as they are, the Renaissance in Italy and the later art of France and England, contain the main body of tradition for us, and though the Greek and Roman work explains much of these things, I feel very strongly that it is enough for us to direct the chief efforts of our scholariships to France and England, rather than to Greece and Rome. Revivals are excellent influences within reasonable limits; their weakness is their self-consciousness. Roman revivals meant something to 15th century Italians; Greek revivals meant something to 18th century Frenchmen; French revivals even meant a good deal to 19th century Americans; but to 20th century Canadians, English revivals will have a more real meaning, and there is this to be said for them, that mere imitation in this case is out of the question. The serene sentiment, traditional in English art, we may hope to continue to achieve; we must, however, give up the physical details of mullioned ranges of lights and parapeted roofs—therein there is hope for Canadian architecture as such. It must invent!

The study of archaeology or our traditions needs a background, (and the historical department of any university should be able to provide that) before a beginning is made with the history of architecture. That is the weak point of lectures on ancient architecture to the public or to students in offices. Half the meaning of St. Peter's, and Westminster, and the Parthenon is lost if Papal, Edwardian and Periclean policies and the popular forces behind them are not subconsciously applied by those who would learn their secrets.

Science for an architect is, after all, not a very serious affair; of course, a thorough scientific training is a very desirable thing, but "life is short and art is long," and literature and history are, I firmly believe, of more importance to an architect. His mathematics may well stop short of the calculus. Physics is vital up to a certain point, but the ultimate constitution of matter will not help him to "build for eternity," as Wren expressed it, or express human sentiment in what he builds. Chemistry bears directly, it is true, on hygiene, but hygiene (from questions of pure air and pure water to those of heating and ventilation appliances) can, I think, be grasped in principle with very little chemical knowledge.

Construction may be regarded as the architect's branch of applied science. Possibly elementary construction can be best learned by practical experience, but as it is quite as impossible to teach composition in architecture to people who do not know how roofs and floors and windows are made, as to teach literary composition to folk who cannot parse words and analyze sentences, even elementary building construction (mere technology as it is) has to find a place in a university course. Structural design is a subject scientific enough to be admitted by a university faculty without protest. My own view is that an architect should know just enough about structural engineering to have the fear of death and judgment always by him and induce him to call in the engineer before, rather than after, things have been built. Familiarity with the stresses in a 100-foot roof truss will certainly not breed contempt for the possibilities and responsibilities involved.

Professional Practice is a matter on which I should like to say a great deal, but time will not permit. To speak and write the King's English and one other language; to know how to construct a short essay, report, paper or speech; to behave to inferiors, equals and superiors respectively, with courtesy, charity and dignity. These things are expected of a college man, and by hook or crook a good deal can be done even in an architectural department to justify the expectation. It was done by Prof. Ware at Columbia.

Specification writing is very badly done all over the world, and yet no better exercise in form and construction could be undertaken by a student of literature. By lectures and exercises much can be done to show how to say what has to be said, briefly and in order and once only.

Conditions of contract and building by-laws, I almost think, should form a part of any good citizen's education, while certain aspects of the law which can be dealt with in university courses to architectural students should prove invaluable in later life.

Drawing—In administering to the student the many subjects which fall within the six groups—design, æsthetic, archæology, science, construction and practice— one lecture to three hours of graphical work will be found to work out well.

Eye and hand, and imagination too, can, I think ,be trained far more rapidly by modelling than by drawing, and for the sake of this technical suavity, modelling all through the course is desirable. Freehand drawing, as such, is hardly a subject.

All sorts of drawing and sketching are connected with the work in design and rapid memory sketching, freehand and mechanical, and elaborate measured drawings, are all involved in the study of archæology.

The ornament and decoration in connection with æsthetic implies a good deal of water color work and free sketching.

Construction gives ample opportunities for practice in the preparation of general working drawings and also for steel plans.

Descriptive geometry, sciography, stereotomy and perspective, besides their scientific value, afford good practice in mechanical drawing and are essentials, in my opinion, in the work of the earlier years.

These (counting the incidental drawing as one) seven parts of architectural education can be begun in a college course, and for an ordinary general practitioner of our trade, is to be hoped that none of them would end there.

Some of these things may be held unnecessary, and I wish I could be convinced of that, for the expense of my department, where these things are all done as I have explained, is a grievous question with those responsible. Some things such as post-graduate work in Ecclesiastical and Landscape Art, might be though desirable, but I feel that these can only be studied on the higher plane where they exist, in merry England, happy France and smiling Italy, and this brings me to outside influences in architectural education in Canada.

Outside we have no museums as yet, but we shall have some soon, and it is devoutly to be hoped that the nation's traditions will find adequate representation in them and that they will not degenerate into mere treasure houses of curios, bric-a-brac, pictures and things rich and rare. There is some reason to hope that at the Victoria Memorial Museum at Ottawa parallel type collections of French and British art (architectural detail and decorative sculpture that is) from 1000-1800, will be installed, together with a library of art, a collection of industrial arts, and a gallery of home industries. But all that is another story, and his Majesty's Ministers have not yet dealt with the petition concerning these things.

Outside we have few old buildings worth measuring, though quite a number that should be preserved. In Montreal there are some examples of the purest Louis XV. and the late Georgian work. Still, our architectural students must go far afield for their direct study of past tradition, and it is high time that every Province had a good scholarship to take a man to England, France and Italy for a year, and that the Dominion had a series of travelling scholarships for special study in the realms of art.

Hitherto the main outside influence in professional training has been due to the fact that at no great distance, in the cities of the United States, more work and better work was being done. Thither went, and still go, the Canadian students of architecture, to bring back second hand ideals of the Beaux Arts school, which were, perhaps, better than nothing, but very far from supplying us with national traditions. For what has Canada, either French or English, Lower or Upper, Maritime or Northwest, to do with 19th century Paris? The far flung vault of Beauvais, the jewelled wlals of Blois might well inspire a Quebecer, but latter day French academic design, a petrified art lagging behind the emancipation of French painting and French sculpture and oscillating between the "Neo Grec" and the "Louis XIV." What, I ask, has that to do with us?

Now we are beginning at last to achieve as good work as our friends to the South, and it is the museums, libraries and design schools of the United States, quite as much as the office work, that still draws so many of our students across the line; and the libraries and museums of Canada will soon, I believe, be adequate to our needs. What about the offices? for we can do without colleges, museums and libraries, but we cannot train architects without properly organized office experience and practical work.

In older lands, where a thousand years of architectural history stands revered and respected in every city, an apprenticeship or a pupilage system, though apt to shorten the general education of the architects, is adequate, but we, here, must rely on college education, museums and libraries, instead of old buildings, and would make a fatal mistake if we did not organize our office training better in the future than we have done in the past. Of course, supply and demand must be taken into account, but I think four or five years, bound to a principal, or, in case of college students, say three years, part of which could be done in the long vacation, should be made a universal requirement. The power to do this rests with the Provincial organizations. It is bad for the student to get a little experience here and a little there, and it is cruelly unfair to the careful architect whose office has an educational influence, that no sooner has he taught a boy something than he is held up for a rise or given the slip.

The architect who is an artist deserves his help cheaper than the architect who is a commercial agent only, and without cheaper help the best kind of work cannot be done. When things are slack it should not be necessary, as it now is, to disband the office. By the present arrangement the art suffers, the office student suffers, and the architect suffers.

We can only make a good thing of our trade by doing far too many jobs at a time as things are. If an architect could by exercising some restraint on his output and by doing things more to his own real satisfaction, at the same time establish a reputation for giving good experience, pupils, apprentices and improvers would help him out, provided such status were recognized and encouraged by the by-laws of the associations. The assistant paid rather more than he is worth cannot be spared to run about on the job, and cannot be expected to identify his interests with those of his master, when he only sees one end of the work.

There is a tendency among some of my friends here to have a childlike faith in what the university can do. In future, let us hope to see the offices doing their full share of the teaching, the schools of architecture doing their little part, the local public theirs by providing museums and libraries, and the Government theirs, by endowing scholarships.

The teaching of architecture geenrally will, I think, undergo some drastic changes before long. The history of architecture has to be approached in a new light—it has been regarded as technical education—as a means for enabling people to forge and imitate past styles in approximate purity. It should, I think, be treated as a purely "culture subject," like Latin and Greek and Anglo-Saxon, as a means of enabling people to understand what the art of design is—the great popular art of expressing national sentiment.

The public at present suffers from that little knowledge which is such a dangerous thing. They know the difference between Norman work and Roccocco in a superficial sort of way, by sight, not by feeling, and they think the greatest compliment they can offer one of us is to recognize in our performances some resemblance to past types, and "fellows of the baser sort" trade upon this poor thin semblance of culture and give them modern forgeries, more or less ingenious, of Tudor, or Francis I., or Early English, or what not. If the much abused word "style" could just be stricken from the vocabulary of every architect for a decade, the educational value of the omission to the public would be immense. We could, I think, [illegible] some real style [illegible] having to break our hearts over it.

Our architecture should be "solid, proportional, according to the rules" (which means that effects should be calculated and not be accidental), "masculine and unaffected." That is how Inigo Jones put it, and "built for eternity," as Wren used to say. Our architecture should be as logical to our climate and our materials as were the flat-pitched colonaded fanes of Greece and the steep-roofed buttressed churches of England. It should be simple, natural, dignified, true to its purpose, whether cottage, house, shop, office, church or town hall, [illegible] from our fathers, with nothing of the "insolent boast" and the "slaves' nightmare" which Morris saw and fought against in the artificial art "all French and fine" which hails from the place and period most away from all our aspirations the court of Versailles.

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[illegible]

[illegible] of all kinds.

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Few manufacturing concerns in the building specialties line are better known to architects and builders than Samuel Cabot, Inc., Boston, Mass., inventors and manufacturers of Cabot's creosote shingle stains, Cabot's sheathing and deafening quilt, waterproof cement stains, waterproof brick stains, and Conservo wood preservative. This firm has constantly applied scientific chemical principles to the production of a line of building specialties which is recognized as of the highest type

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Cabot's sheathing and deafening quilt has introduced a new era into the insulation of houses, cold storage and sound-deadening. Before its invention, sound-deadening was accomplished only by the most haphazard methods. The Cabot quilt is a matting of cured eel-grass which has the power of breaking up and absorbing sound-waves, and which is thoroughly sanitary and is absolutely proof against decay. It is also inflammable and a protection against fire. The discovery of the valuable properties of quilt for this purpose is one of the great achievements of the late Mr. Cabot. It is of interest to know that a large part of the eel-grass that goes into the manufacture of this remarkable material is purchased in the Canadian Maritime Provinces. The use of quilt is increasing in all parts of Canada, and in our climate its value for insulating houses is especially great. The makers claim that it renders houses practically wind and frost proof and that it pays for itself in two winters in fuel saved, to say nothing of comfort.

Residence of Mr. George von L. Meyer, U.S. Secretary of the Navy. Stained with Cabot's Waterproof Cement Stain.

For several years now this company has been perfecting a waterproof cement stain, designed to waterproof and color exterior cement surfaces. They have finally produced an article which stains cement just as their shingle stains stain wood, and the coloring effects produced are exactly as if the cement had been made in that color, and yet the cement is not weakened, as it would be if the color were mixed in it. The waterproofing effect is complete and permanent, and the demand for these stains is reported to be growing steadily.

The company also manufacture Cabot's waterproof brick stain and preservative, which does the same for brickwork as the cement stains for cementwork.

Wooden Floors for Factories

New York, January 19, 1910.

Editor, "Contract Record":

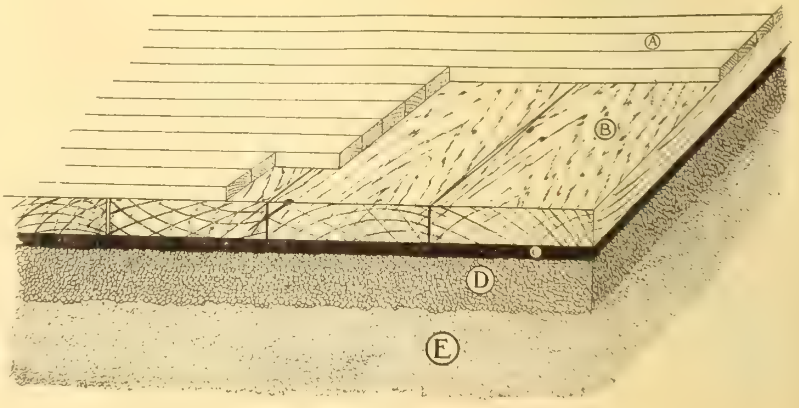
As this is a subject of great interest to engineers and mill owners, the writer recently investigated the various methods of protecting such floors against decay and submits the following to supplement the article in your issue of November 24, 1909.

The accompanying illustration shows a cross section of construction which conforms to the best engineering practice. The reference letters refer to—A, hardwood wearing surfaces; B, planking; C, 1-inch tar and sand; D, foundation course; E, earth.

Wooden floors laid directly on the ground without air space beneath have two very distinct advantages. First, low cost from saving of piers, heavy timbers and excavations. Second, absolute rigidity regardless of the character of the machinery.

It is, however, necessary to protect the floors against decay, and to do this they must be protected against dampness from the ground. The essential features of this construction are foundation, damp course and planks.

Foundation.—This should be from 3 inches to 6 inches thick, depending on the nature of the soil, and may consist of whatever local conditions make cheapest, either lean ce-



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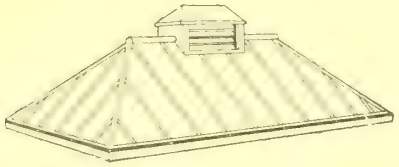

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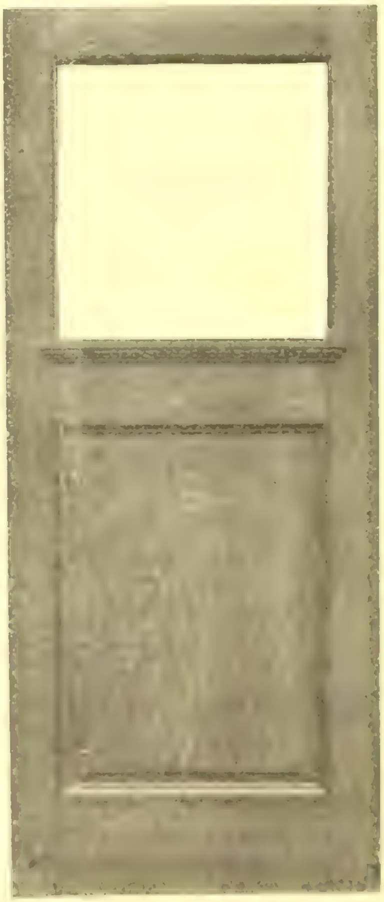

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ment or tar concrete, and the latter may be of either cinders, crushed stone or screened gravel, and should be thoroughly compacted and graded evenly to correspond with the level desired for the finished floor.

Damp Course.—This should be 1-inch thick and composed of sand mixed with enough coal tar from which the water and light oils have been distilled (but containing all the creosote oil), so that all the voids in the sand are filled. Usually 50 to 60 gallons of tar are required to each cubic yard of sand, and a proper test is "If 10 to 20 cubic inches of the mixture at a temperature of 175 to 200 degrees F. be placed in a tight vessel to a depth of not less than 1-inch and patted, it shall be deemed that the mixture contains sufficient tar, if tar shows on the surface."

With the voids in the sand filled, there is absolute protection against dampness* from the ground, and if a good coal tar is used the creosote oil in the tar acts as a wood preservative. Asphalt should not be used in the damp course mixture, as it does not contain any creosote oil, and coal tar pitch is only slightly better in this respect. Although ¼-inch of coal tar pitch on a concrete base will provide ample protection against dampness from the ground, it will not provide a bedding for the planks but what sleepers will be necessary, and furthermore, the pitch does not contain the creosote oil necessary for its wood preserving qualities.

The sand must be dry and both sand and tar heated to 200 degrees to 250 degrees F. and thoroughly mixed. The mixture should be spread while warm and levelled with a straight-edge or rake, but not rolled or compacted in any way except by the bedding of planks on it.

Planks.—These must not be less than 2-inch thick and should be bedded directly on the tar and sand mixture and toe-nailed together. Sleepers should not be used, for they are not only unnecessary but a distinct disadvantage, as the tar and sand mixture provides a perfect bedding for the planks and they are tied together as firmly when the hard wood floor is laid at right angles or diagonally as is a single floor when nailed to sleepers. The planks should be spaced ¼-inch to ½-inch apart, as this will lessen the danger of dry rot, if they are not well seasoned.

Floors Above Ground Level.—Frequently in reinforced concrete buildings a wooden surface is required on some of the floors and the same method used so extensively for the lower floor is becoming quite popular. The 1-inch of sand and tar furnishes suitable bedding for a two or three-inch plank, and this, with the hard wood surface, provides ideal conditions for setting machinery, as lag screws can be used at any point. This method eliminates the wooden screeds or nailing strips which, when bedded in concrete, soon dry rot and are the source of much trouble.

*Dampness should not be confused with water, for this form of construction will not protect against water, and in such cases the usual felt and pitch waterproofing is required.

Yours truly,
Barrett Manufacturing Company.

In connection with the Third Annual Cement Show which is to be held at Chicago on Feb. 18-26 next, the railroads in the Eastern Canadian Passenger Association will make a rate of one fare and one-half for the round trip, on the certificate plan. Going tickets may be purchased any day from Feb. 15th to the 24th inclusive.

The following figures prepared by the Department of Labor, show the proportion in which nearly a thousand accidents were distributed among eight branches of labor: Railway, 326; agriculture, 225; mining, 148; lumbering, 113; navigation, 84; metal trades, 63; general transport, 54; building trades, 46.

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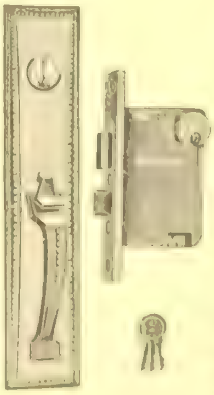

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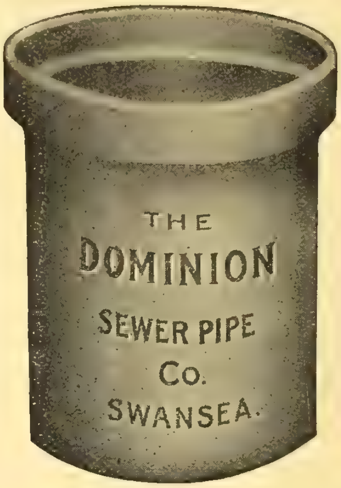

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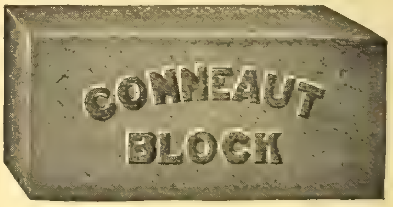

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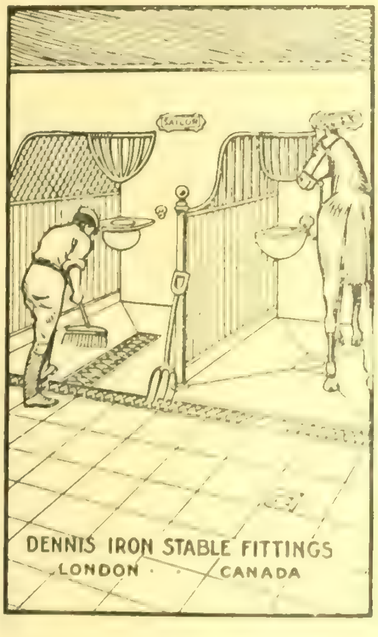

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No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, for foundation work..	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b. with 30 and 5 per cent. off for wholesale:—

	Star	D.D.
10 to 25 united inches........	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7.25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

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(Prices f.o.b. Toronto.)

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Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 35 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish, colors, firsts, 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G. cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

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Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.
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No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

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Furnaces, 45 per cent.; registers, 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.; other specials, 40 per cent.

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For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.
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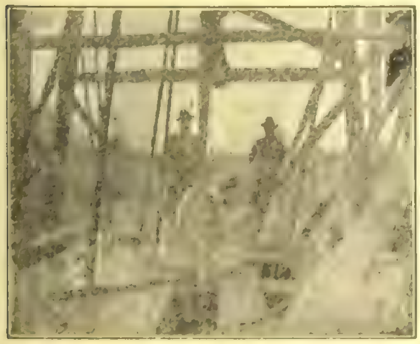
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD



Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
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16 x 24, $1; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 27½ per cent. off.; lead waste, 27½ per cent. off; caulking lead, 4½ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 70; malleable bushings, 67½; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 67½ per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.

7 and 8-inch pipe, 40 per cent.

Light pipe, 60 per cent.; fittings, 70 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots in bags, delivered, Toronto, bags extra, $1.70.

Cement, wholesale lots of 1,000 barrels, f.o.b. Toronto, $1.30.

Crushed stone, $1.25 per ton, f.o.b. Toronto.

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $13.50 to $15 per toise.

Free stone, delivered, $13.50 per toise.

Brown coursing stone, delivered. $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.20 to $1.25 per ton.

Scotch fire brick, delivered, $30 to $35 per thousand.

Steel channels and beams, $2.75 per 100 pounds, delivered.

Lime, per cwt., delivered, 38 cents.

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Manilla Rope, best, per pound, 15 cents.

Hard Wall Plasters, $5.50 per ton.

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(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $7.50 to $8.00 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.

Pure Green Seal Zinc White, ground in oil, $12.50 to $13.00 per 100 lbs.

Boiled Linseed Oil, in barrels, 78 cents per gallon of 9 lbs.

Raw Linseed Oil, in barrels, 75 cents per gallon of 9 lbs.

Turpentine, in barrels, 80 cents per gallon of 8 4-10 lbs.

Pure Linseed Oil Putty, 25-lb. tins, $3.25 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $2.75 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Montreal may construct a filtration plant in connection with its waterworks system.

The Works Committee of the Regina city [illegible] the spending of $363,000 on a trunk sewer.

Officials of the Canadian Pacific Railway, in Winnipeg, have made an appropriation, providing for the construction of fifty miles of the Kootenay Central Railway this year. It is proposed to start work early in March at or near Wardner Station on the Crow's Nest Pass Railway. Tenders will likely be called for early in February. The new line will open up some fertile and agricultural fruit-growing districts in the interior, including the famed Windermere Valley. The route extends north through the Kootenay Valley, and thence via the Columbia Valley to Golden, a distance of 160 miles.

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Heavy and Constructional Hardware.
Iron Castings of all kinds.
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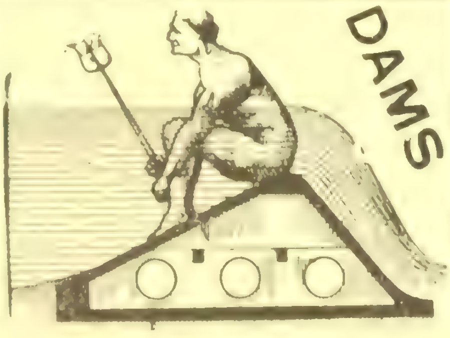

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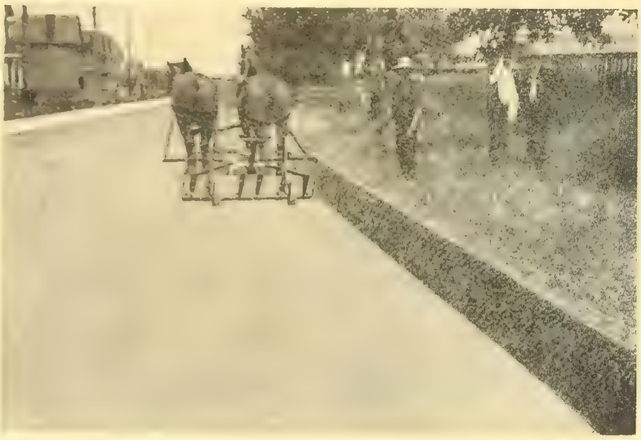

A Word of Advice to Intending Purchasers

Our files for Spring orders for our Handy Reversible Road Grader and Leveller are quickly filling up. If you wish a machine for the Spring work it would be advisable to look into the matter without delay. (Any particulars required cheerfully given.)

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Hamilton, Ontario

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Our factory is the Most Complete and Modern in Canada for the manufacture of

Fine Hardwood Interior Finish

We are furnishing the Interior Trim for a large percentage of the best Residences, Banks, Churches and other Public Buildings in the country. We also contract for all Carpentry Work. We maintain a high standard of workmanship and material. By specifying our high-grade Fittings, Architects and Contractors are sure of completing the work with satisfaction to themselves and the owner. A million feet of Thoroughly Seasoned Hardwoods always in stock.

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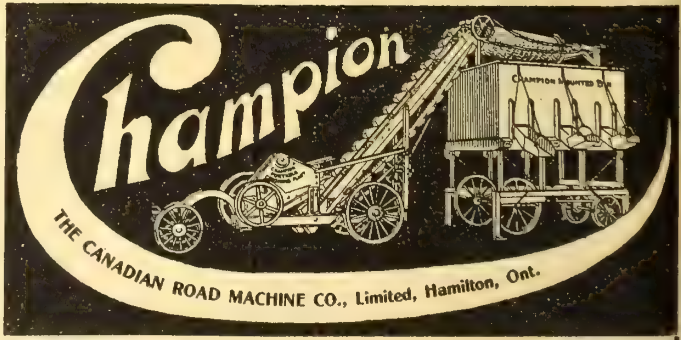
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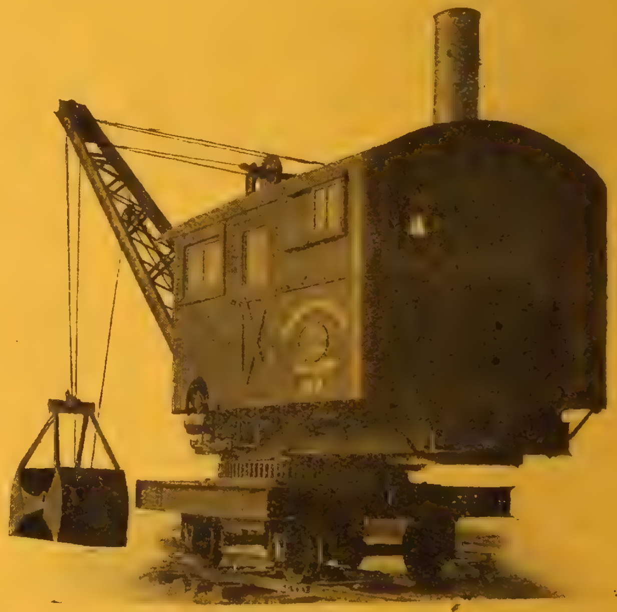

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Municipal Progress, Advance Information

Vol. 24 Toronto, February 2, 1910 No. 5

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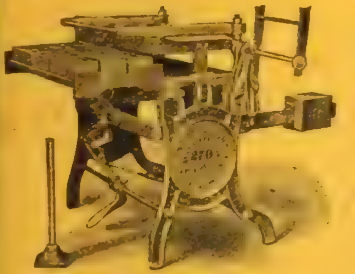

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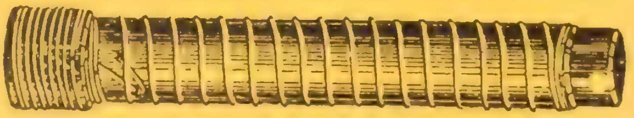

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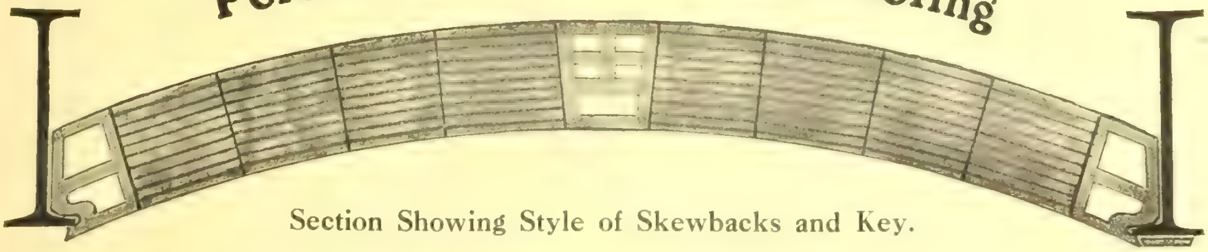

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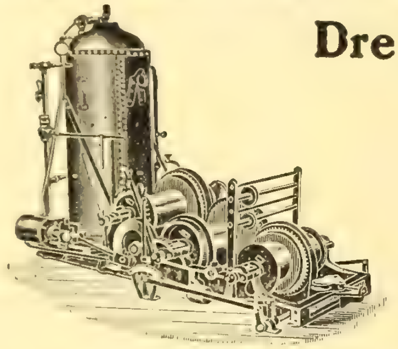

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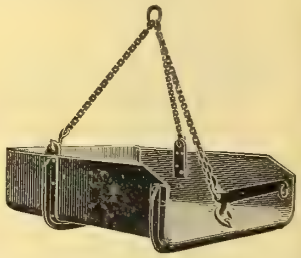

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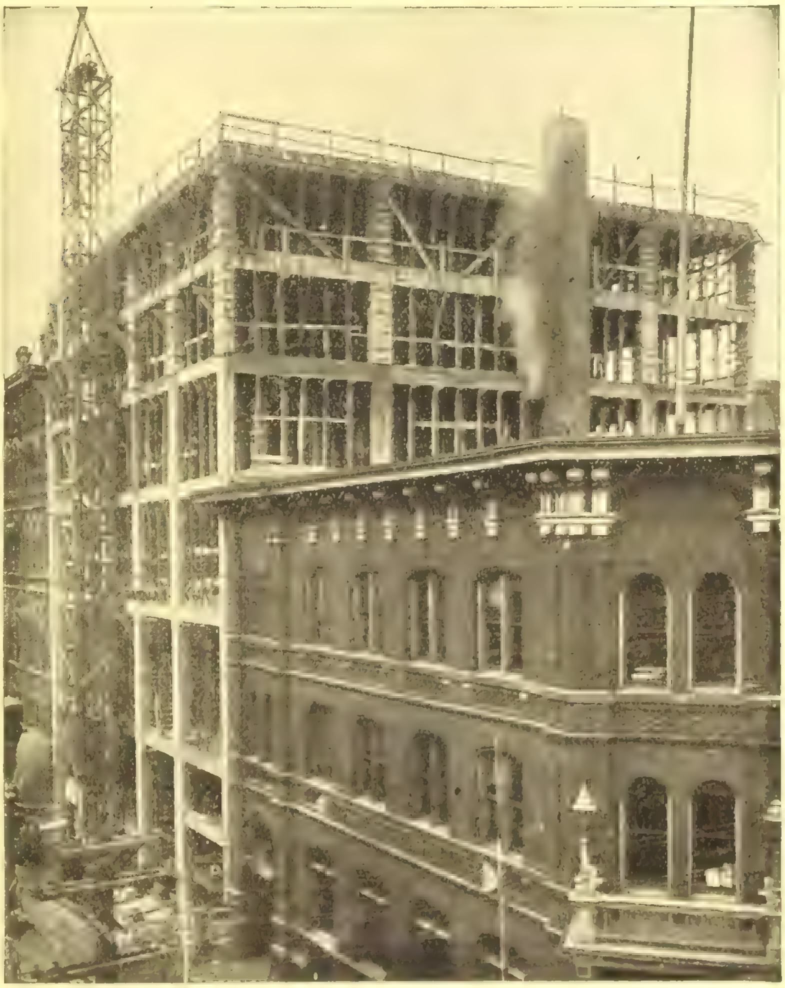

Cut shows Reinforced Concrete Building under construction for the Thomas C. Watkins Departmental Store, Hamilton.

Some Users:

Joseph Vincent, Union, Ont.
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Septic Tanks, St. Thomas, Ont.,
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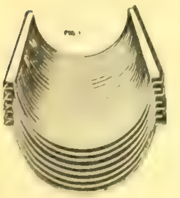
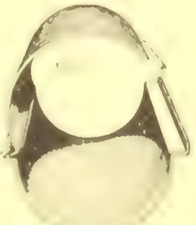
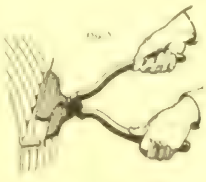


When the sections of Pedlar Culvert, of any diameter—it's made from 8 inches to 6 feet—reach you, they are nested like Fig. 1. Note the two distinct flanges—the radial and the recurved. These fit into each other, and are FLAT, while the CURVE of the culvert is corrugated. Place section on top of section, and the flanges, or locking-ribs, engage easily, as you see in Fig. 2. The joints between one length and another are "broken" no over-lap reaches more than half-way round the culvert's diameter; and this is possible with NO OTHER metal culvert made. It is a most valuable feature, for it reduces the chance of leakage to the very least minimum.





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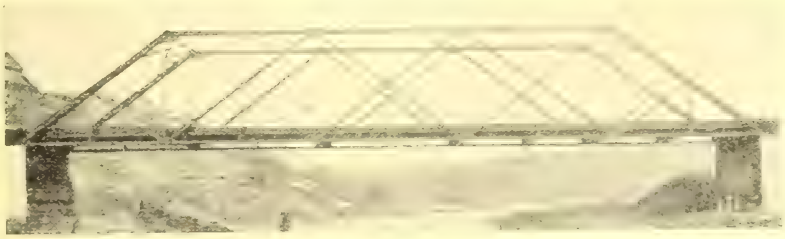

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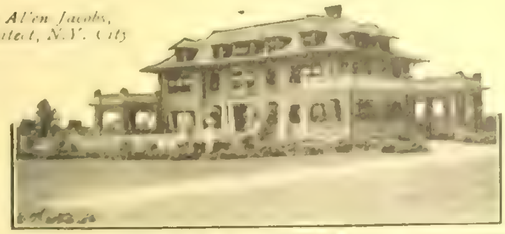

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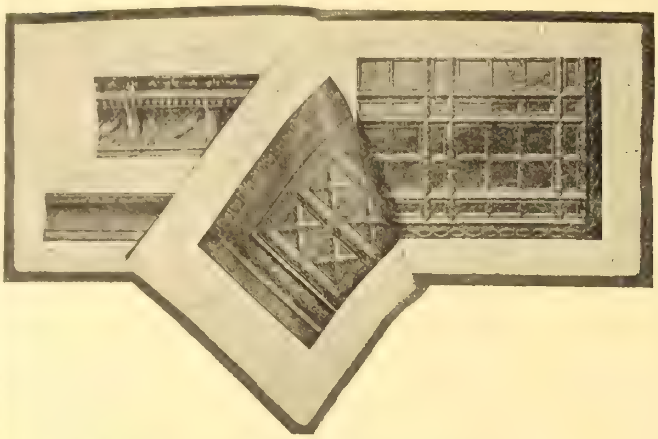

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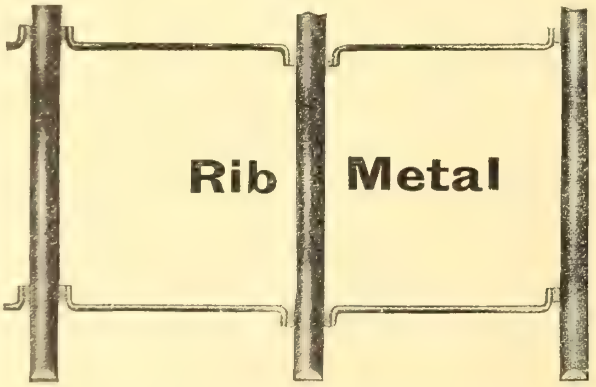

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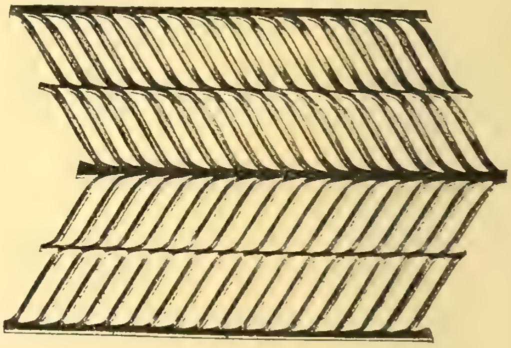

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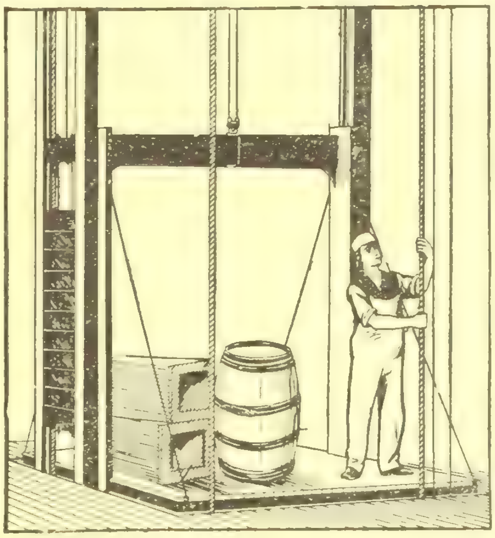

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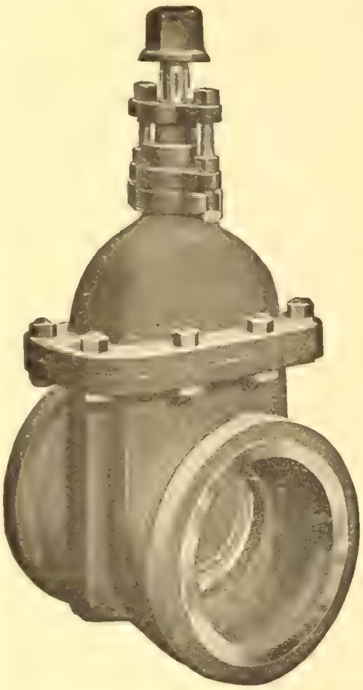

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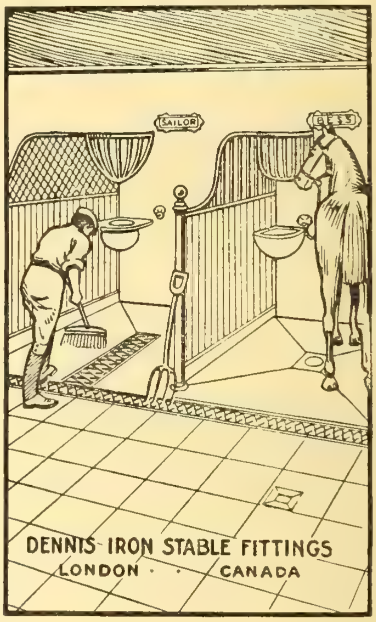

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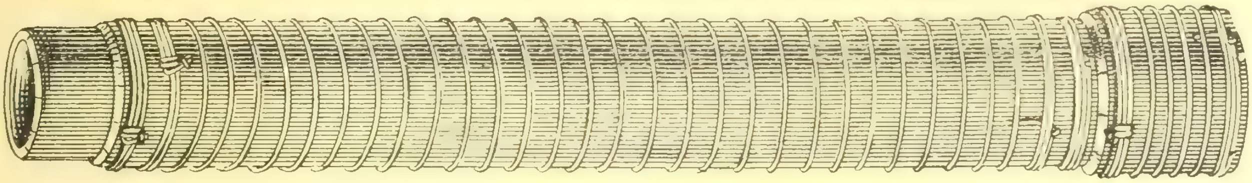

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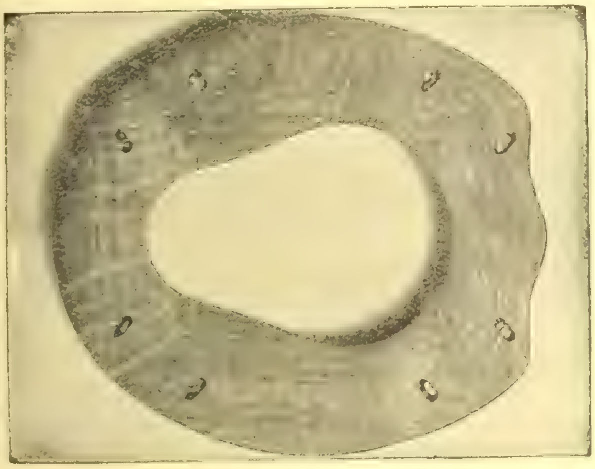

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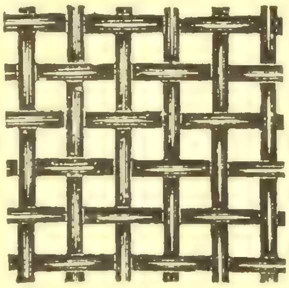

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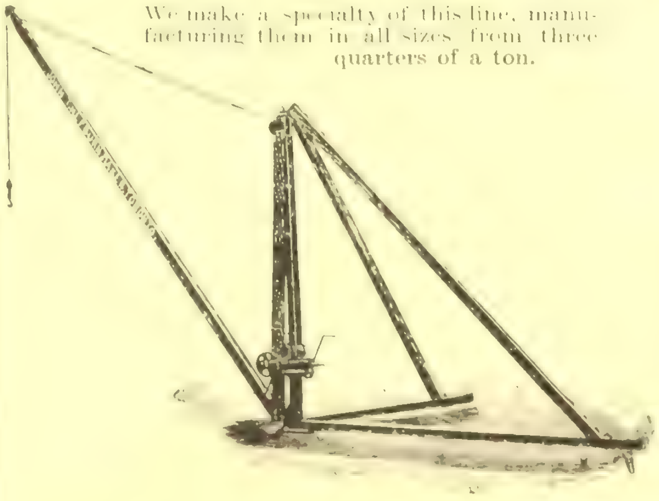

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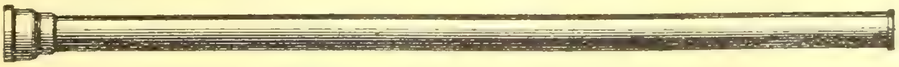

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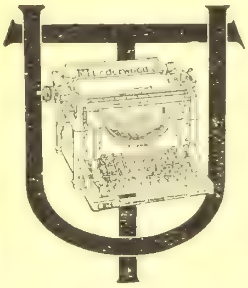

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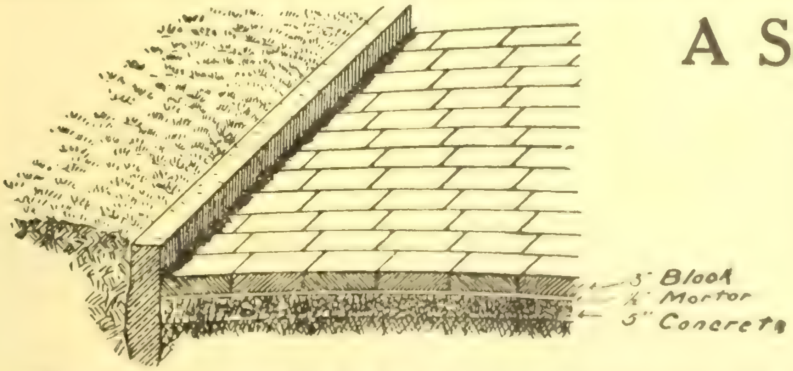

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Georgian Bay Shook Mills, Limited
Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Duncan's Station, B.C.

The installation of a $25,000 sewerage system is being considered.

Edmunston, N.B.

It is understood that this place has been chosen as one of the divisional points upon the G. T. P. The town agrees to put in a water system for which the railway will pay $2,000 per annum.

Edmonton, Alta.

It has been made imperative by an important order just issued by the provincial Board of Health that all municipalities in the province shall have proper and satisfactory sewage disposal systems installed before December 31st. It practically necessitates the expenditure of close upon $2,000,000.

Nanaimo, B.C.

The bylaw providing $100,000 for the installation of a sewerage system was carried.

Ottawa, Ont.

N. J. Ker, city engineer, is calling for tenders for supply and delivery of 42 inch steel intake pipe. For further particulers see advertisement in this issue.

Saskatoon, Sask.

Tenders addressed to J. H. Trusdale, city clerk, will be received until February 14th for the following, f.o.b., viz.: 100 lbs. 1-inch palmetto packing; 75 lbs. 3-4-inch palmetto packing; 35 lbs. 1-2 inch palmetto packing; 20 dozen hand hole gaskets; 5 dozen manhole gaskets; 25 lbs. spiral packing, 5-8 inch; 10 lbs. spiral packing 1-2-inch; 50 lbs spiral packing 1-4 inch.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman, Board of Control, will be received until February 22nd, 1910, for supply of cast iron pipe, main drainage works. For further particulars, see advertisement in this issue.

AWARDED.

St. Catharines, Ont.

At a meeting of the Water Commissioners the report of the Extension Committee was adopted, recommending the quotation of the Canada Brass Company, of Galt, be accepted for brass goods required for the current year; that of Coy Bros. for galvanized pipe and pig lead, and that of the James Robertson Company, of Toronto, for lead pipe.

Vancouver, B.C.

W. McQueen, city clerk, writes that the contract for supply of steel water pipe for the ensuing year has been awarded to Messrs. Evans, Coleman & Evans, Vancouver, at $9,600; cast iron pipe to Messrs. Robertson Godson, Vancouver. The following is a list of bids: Canadian General Electric Company, total $11,760 (4-inch cast iron pipe); A. J. Forsyth & Company, total $10,497.50 (price for 6-inch steel, $9,424.80; for 8 inch steel, $3,669.60 for 12 inch steel, $17,820); Robertson-Godson Company, total, April, $8,477.50, May, $8,445 (price for 6-inch steel, $10,334.06, for 8-inch steel, $3,867.72, for 12-inch steel, $14,502.84); F Hankin, totals $9,587.50 and $8,562.50 (2,240 lbs. and 2,000 lbs.); C. F. Jackson & Company, 4-inch cast iron pipe, $9,912.50; Gartshore-Thompson Pipe Company, $12,000; C. Gardiner-Johnston & Company, (price for 6-inch steel, $9,424.80, 8-inch steel, $3,643.20, for 12-inch steel, $17,688); F. Darling & Company, price for 6-inch steel, $9,794.40, 8-inch steel, $4,435.20, 12-inch steel, $24,024); Evans, Coleman and Evans, 4-inch cast iron pipe, $9,600, price for 6-inch steel, $6,837.60, for 8-inch, $3,009.60, for 12-inch $14,652; Crane Company for 6-inch steel, $10,315.53, for 8-inch steel, $3,981.88, for 12-inch steel, $14,520.

Railroads, Bridges and Wharves

Allumette Island, Que.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, will be received until February 28th for the construction of piers, abutments and approaches for a highway bridge across the Culbute channel of Ottawa river at Chapeau. Plans at Department of Public Works and on application to the local postmaster and the post office at Pembroke, Ont.

Montreal, Que.

The C. N. R. have made application to the Harbor Commission for berthing space.

Ottawa, Ont.

The time for the construction of the Esquimalt & Nanaimo Railway and the Edmonton, Dunnegan & British Columbia Railway has been extended.

Sault Ste. Marie, Ont.

The report of Mr. Sing, district engineer in the Department of Public Works, recommends that the proposed dock be made 18 feet deep, with four feet of head room under the keel of the vessel when docked. The total cost of the dock is given as $538,576, with an additional one hundred thousand dollars for buildings and equipment.

Winnipeg, Man.

Tenders for the Brant street bridge are to be called by the Board of Control. Time limit, March 7th. Estimated cost, $299,646. Controllers McArthur and Cockburn.

AWARDED

Adamsville, Que.

The Laurentian Construction and Engineering Company, Limited, have been awarded the contract for the construction of a bridge over the [illegible] of the Yamaska river, by the municipality. The tenders submitted are as follows: Laurentian Construction & Engineering Company, Limited, [illegible]; Phoenix Bridge and Iron Works, Limited, [illegible]; MacKinnon, Holmes & Company, Sherbrooke, Que., [illegible]; Structural Steel Company, Limited, $10,600. The work will be commenced almost immediately. E. Vanier, town engineer.

Howick, Que.

D. R. Hay, secretary-treasurer, writes us that the contract for the erection of the Allens' Corners' Bridge has been awarded to the Western Bridge & Equipment Company, of Chatham, Ont., subject to the approval of the government engineer. Price $15,549.50. The following is a list of other tenders received: Dominion Bridge Company, Montreal, bridge only, $8,937; New Lattice Bridge & Concrete Works, Chatillou abutments, $8,800; the Jenks-Dresser Company, Sarnia, Ont., bridge only, $9,970, bridge and abutments, $18,150; Henry Williams, Cornwall, Ont., abutments only, $9,952; John H. Leahy & Company, Montreal, abutments only, $10,250; Phoenix Bridge Company, Montreal, bridge and abutments, $18,350; Jas. A. McBain, Ormstown, Que., abutments only, $10,600; Laurentian Construction & Engineering Company, Montreal, $18,500, abutments, $9,200; The Canadian Siegwart Bridge Company, Montreal, Que., their tender reads as follows, $18,550, piles and pile driving, extra; R. MacMannus & Company, Hamilton, Ont., bridge only, $10,200; R. T. Smith & Company, Westmount, Que., abutments only, $7,400; T Lemoine & Fils, Montreal, Que., abutments only, $7,300; Structural Steel Company, Montreal, Que., bridge and abutments cash, $15,400; time, $15,600; paid 1st of March, 1912, 16,100.

Outlook, Sask.

It is stated that the contract for the erection of the C. P. R. bridge over the South Saskatchewan river here has been let to J. D. McArthur & Company, Limited. Dimensions, over 3,000 feet in length, 146 feet in height.

Tiverton, Ont.

Bruce Township Council has awarded the contract for the building of reinforced flat arch bridge 54 foot span over 6th concession Willow Creek to C. S. Wood, this place. Also reinforced flat arch bridge 25 foot span, over the 8th concession to C. S. Wood.

Toronto, Ont.

The city council awarded to the Don Construction Company the contract for constructing the piling at the Wilton avenue bridge, the amount being $3,928.78. Through some oversight a letter from the company, withdrawing their tender, was not read at the council meeting, and the company will forfeit the $70 deposit. The next lowest tender, $5,418.38, was from R. Arbuckle, and the indications are that the contract will be awarded to Mr. Arbuckle.

Winnipeg, Man.

It is stated that the contract has been signed between Kelly Bros. & Mitchell, and M. H. McLeod, manager of the C. N. R., for the Pembina street subway, and construction work will be started at once. Noted [illegible]

The Charlottetown Foundry & Machine Company, Limited, Charlottetown, P. E. I., [illegible] sold out to Bruce Stewart & Company, Limited.

Public Buildings, Churches, Schools, etc.

Parrie, Ont.

Tenders are being called until the 16th of February for the heating of the county gaol. For further particulars see advertisement in this issue.

Calgary, Alta.

The congregation of Knox Church have purchased six lots on the corner of Sixth avenue and Second street, where it is understood that a new church will be built when the present church property is disposed of.

Dunboyne, Ont.

Tenders are being called until February 19th for the erection of a new brick Methodist church. Plans at residence of Dr. L. A. Brown, Water street, Aylmer.

Edmonton, Alta.

The recommendation of the Public Library Board that the city purchase the corner property on Howard and Rice street for a library site was accepted, and the city solicitor was requested to bring down the necessary bylaw at once so that the matter might be voted on without delay.

The congregation of the First Presbyterian Church on the corner of Third street and Jasper avenue, are said to be in favor of selling their present building and erecting a new church.

The enlargement and remodelling of Westminster Presbyterian Church was discussed at the annual congregational meeting and referred to the board of managers. Estimated expenditure, $5,000.

Fort William, Ont.

It is stated that John Whalen, owner of the Lyceum theatre will build a theatre here. Estimated expenditure, $75,000.

Minnedosa, Man.

Tenders are being called until February 5th for the erection of a brick veneer church on section 21, township 18. Plans at Black Bros.' store. J. Gugin, secretary.

Milton, Ont.

J. A. Ellis, architect, Toronto, it is reported, has condemned the school buildings and as soon as his plans are submitted, it will be decided whether to remodel the buildings or erect new ones.

Montreal, Que.

The following work will in all probability be executed at once:—Extension to the Church of the Ascension, Park avenue, Laurier Ward; new church on Park avenue extension, for mission purposes; new church on St. Denis boulevard, to be named the Carmichael Memorial Church; Rossland Mission Church on Marquette street; extension to all Saints' Church, on Marie Ann and St. Denis streets; new church at Blue Bonnets or St. Pierre aux Liens; extension to St. Stephens Church, Lachine, P.Q.; St. Columba Mission Church, Kensington, is to be enlarged; St. Clement's Church in Verdun is to be rebuilt; a new hall is to be added to St. Cyprian's Church on Masson street and to St. Augustin's Church, Rosemount; and St. Barnabas Church in St. Labert, P.Q. Rev. J. J. Willis is interested.

Tenders addressed to W. J. White, secretary-treasurer, will be received until February 10th by Montreal Technical School Board for (1) heating and ventilating, (2) switchboard and power wiring in connection with the Montreal Technical School. Plans at room 43, Street Railway Chambers or at the office of J. S. Archibald, architect, 50 Beaver Hall Hill.

New Westminster, B.C.

Arrangements are being made for the erection of a new church and school at Fraser Mills. A. D. McRae, president, Fraser Mills Company.

The Lutherans of this city propose erecting a church here in the near future, considering the sect strong enough now to support two churches, one in Westminster and one across the river.

Owen Sound, Ont.

Tenders are being called until February 4th, 1910, for the erection and completion of the West Side Methodist Church. Plans at store of A. W. McFaul, 912 Second avenue east. Jas. C. Miller, chairman, Building Committee.

Quebec, Que.

It is understood that it is the object of the government to construct a new wing to the parliament buildings, work on which may be started next summer. Estimated cost $250,000. Architects, G. E. Tanguay, Quebec, and J. O. Marchand, Montreal, are preparing plans.

The Harbor Commissioners will reecive tenders until February 7th for the construtcion of a landing shed, 450 by 80 feet wide to be situated on the Point a Carcy pier. Drawings, etc., at office of the Harbor Engineer.

Saskatoon, Sask.

At a meeting of the Board of Governors of the University of Saskatchewan, plans prepared by Architect Brown, of Montreal, were submitted. Three buildings, a general university building, a dormitory and a central power house, will be built. Estimated expenditure, $350,000. Plans are being prepared for a machinery hall. That and agricultural buildings will also be erected. Tenders will be called and building operations commenced on the opening of spring.

St. John, N.B.

It is stated that the Dominion government has begun to expropriate land for the erection of the new armory.

Saskatoon, Sask.

The hospital board is asking the city council to submit a by-law to the people to raise $110,000 for improvements and enlargements to the hospital.

Toronto, Ont.

It is announced that the Y. M. C. A. has in view the erection of four buildings at different points in the city at an estimated cost of $600,000. Executive committee is composed of Messrs. E. R. Wood, S. J. Moore, H. Ryrie, and others.

Weston, Ont.

It is stated that a new High school and post office building are under consideration.

At the annual meeting of Deer Park Presbyterian Church a committee was appointed to procure plans, etc., for a new church in the St. Clair avenue district. Messrs. D. Chalmers and J. S. Anderson are on the board of managers.

At the annual meeting of the Chester Baptist Church the trustees reported having purchased a lot on the corner of Danforth avenue and Bowden street, on which a new Sunday school will be built in the near future, the church being granted the privilege to canvass the different Baptist churches for funds for the year 1910. Finance Committee — H. Revell, A. Hallett; Clerk, A. J. Albon.

Victoria, B.C.

The Philharmonic hall and other buildings owned by Dr. G. L. Milne, were destroyed by fire on the 20th inst. Total estimated loss, $30,000.

Plans have been prepared by Mr. T. D. Sedger for the improvements to the Victoria West Athletic Association. D. S. Tait, L. K. Okell and others form a building committee. Estimated expenditure, $5,000.

The Y. M. C. A. building committee is calling for tenders for the removal of the houses on its site at the corner of View and Blanchard, also for the excavation preliminary to building. The contract for the building will be awarded the first week in February. Noted in issue of January 12th.

Extensive plans for the construction of a new Union Club building on a site on Humboldt street, are now being discussed by members of the executive of the club. Construction will be commenced before the spring is far advanced. Estimated cost of building, $80,000. The arrangements will be decided upon at a meeting of the club executive to be held in about three weeks. Plans will then be called for. Noted in issue of December 29th.

Vancouver, B.C.

The plans re the building of the Labor Temple have been changed. The idea of having a reinforced concrete building has been abandoned. Estimated expenditure, $75,000. Architect, Hooper. Noted in issue of January 12th.

The question of the erection of an Isolation hospital is again before the council, with the result that an option has been taken on a lot in the east end for its erection.

Windsor, Ont.

A company knownl as the Masonic Temple Association of Windsor, Limited, with a capital of $50,000, has been chartered by the Ontario government for the purpose of building temple here. It is proposed to erect a modern three storey building.

Winnipeg, Man.

The Westminster Presbyterian Church are contemplating the selling of their site and the building of a new church west of Sherbrooke street. J. B. Mitchell is interested.

Chief Buchanan has asked that tenders be called at once for the construction of fire halls in wards 1, 3, 5 and 6. Estimated cost of each $15,000.

AWARDED.

Lethbridge, Alta.

The contract for alterations to the Dominion building here, has been awarded to the J. McDiarmid Company, Limited, of Winnipeg, at $7,777.50. The same company has also been awarded the contract for alterations to the old post office at Winnipeg, the price being $41,000.

Montreal, Que.

Marchand & Haskell, architects, 164 St. James street, have awarded the contract for the erection of a gymnasium for Montcalm school, to Messrs. Martineau & Prenoveau, 643 Berri street.

Mr. Alphonse Content, architect, has awarded the contract for a fireproof addition to the Ste. Therese Seminary, to F. J. Fautaux.

Pembroke, Ont.

The contract for the post office fittings here has been given to R. A. Sproule, of Ottawa, at $790.

Quebec, Que.

The contract for alterations to the examining warehouse here has been awarded by the Federal Public Works Department to Jinchereau & Lamonde, of Quebec, at $2,997.

Quebec, Que.

Robt. Anderson, of Ottawa, has been awarded the contract for electric light wiring in the post office here, the contract price being $2,944.

Whitby, Ont.

H. Gay & Sons, of Courtice, Ont., have been awarded the contract for interior fittings in the public building at Whitby, the contract price being $1,581.

Toronto, Ont.

The contract for the drill hall fittings in Toronto has been warded to M. A. Pigott & Son, of Hamilton, at $8,400.

Knowlton, Que.

J. T. Schell, of Alexandria, Ont., has secured the contract for armory fittings in the public building here, at $397.

Residences

Fort William, Ont.

Tenders addressed to R. E. Mason, architect, Victoria Block, will be received up to February 21st, for residence for F. R. Morris, Esq.

Montreal, Que.

Messrs. MacVicar & Heriot, architects, 104 Union avenue, have prepared plans for the erection of seven houses for Mr. Geo. Purnford, and tenders will be received until February 11th, 1910.

Plans have been prepared for a residence to be erected on McGregor street for Mr. Frank Scott. Tenders will be received until February 4th. Messrs. MacVicar and Heriot, architects, 104 Union avenue.

Mr. Alphonse Venne, architect, 15 St. Lawrence Boulevard, is preparing plans for three stores and twelve flats to be erected for Mr. Wilfril Besette, on corner of Esplanade and Bernard streets.

Mr. Scott, Mance street, will shortly erect two houses on Roslyn avenue, Westmount, for which plans and specifications will be made by Geo. T. Hyde, architect, 157 St. James street.

St. John, N.B.

The former residence of Lieut.-Governor John Boyd and recently owned by the J. H. Thompson estate, has been bought with the intention, it is stated, of having it rebuilt as an apartment house.

Toronto, Ont.

The residence on the northwest corner of Sherbourne street and Wilton avenue has been purchased with the intention, it is reported, of converting it into an apartment house. Enoch Thompson, Limited, effected the sale.

Vancouver, B.C.

A new modern apartment house will be erected shortly on the corner of Robson and Burrard by J. H. Singer, real estate broker. J. Donnelan, architect.

The following building permits have been issued recently: J. B. Armishaw, frame dwelling, 489 Thirteenth avenue east, $2,660; J. E. Guinet, 1216 Woodland drive, two houses, $4,000.

Victoria, B.C.

Permits have been issued to J. H. Todd for dwelling on Crescent street, to cost $6,000, and to J. M. Savage for alterations to residence on St. Charles street, to cost $5,000.

Winnipeg, Man.

Plans and specifications for five large apartment buildings are being prepared by P. C. Samwell, architect, 516 Builders' Exchange. J. E. Wilson, general contractor, has the sites already selected, viz.: two on the corner of Mountain avenue, estimated expenditure, $35,000; three on the corner of Langside and Preston, estimated expenditure, $170,000. Tenders will be called as soon as specifications are ready.

G. H. Walton, real estate dealer, it is reported, is contemplating the erection of a 3 storey apartment house at Bannatyne avenue and Ellen and Dagmar streets, to cost $320,000. W. W. Blair, Northern Bank Building, architect.

Tenders addressed to M. Blankstein, architect, 450 Dufferin avenue, will be received until February 5th for raising, excavating and completing basements for two double houses, for D. N. Ribstein, Esq.

Business Buildings and Industrial Plants

Amherst, N.S.

The four storey building of the Black Printing Company was destroyed by fire on the 28th inst. Estimated loss, $30,000 to $35,000.

Brandon, Man.

The agreement between the city and the C. N. R. has been signed. By this the company agrees to have the structure completed by April 31, 1911. Noted in issue of January 5th.

It is stated that Hooper & Hooper, architects, Winnipeg, are preparing plans for extensions and alterations to the Imperial hotel here which will cost $70,000. When completed the hostelry will have 150 rooms fitted with electric lights, bath and all modern conveniences.

Charlton, Ont.

Several business buildings, including those of McClung (hardware), Giles & Company, and others, were destroyed by fire. Total estimated loss, about $200,000.

Cobourg, Ont.

It is expected that the C. N. R .and G. T. R. will erect stations here during the year.

Fort William, Ont.

It is reported that Nicholson & Bain, grocers, will build a wholesale house early next spring, and Mayor L. L. Peltier, a warehouse adjoining. Another warehouse on a 100-foot lot recently purchased by Neeland & Lumby will be constructed shortly. Sites for these between Christina street and Mary street.

The Superior Rolling Mills Company, which is expected to establish a factory here next spring was incorporated in Ottawa with a capital of $500,000. Noted in issue of January 12th.

Hamilton, Ont.

The Otis Fenson elevator works, it is announced, will make additions to its plant here to cost $200,000.

The International Harvester Company has decided to spend $100,000 in making improvements to its plant here. Large additions will be made to the grey and wood rooms, after which the company will erect a building to be used as a machine shop and erecting addition.

North Sydney, N.S.

A test is being made in regard to the manufacture of briquette from coal found in this region. Should it be satisfactory, it is probable that a plant will be erected along the banks of Little Bras d'Or. W. A. Mackay is interested.

Ottawa, Ont.

The Clinton Fireproofing Company, Limited, Montreal, have been awarded the contract for [illegible] doors in the Chateau Laurier. General contractors, Messrs. Geo. A. Fuller Company. Architects, Ross & McFarlane, Montreal.

The preliminary plans, etc., for the proposed ten storey building, corner of Bank and Sparks streets, have been prepared by C. P. Meredith, architect.

Woodstock, N.B.

Three plans are being considered for the erection of the proposed passenger station, —wood, $20,000; brick, $26,000; and stone, $30,000. Mr. Downie, C. P. R. superintendent.

Montreal, Que.

It is reported that the Mark-Brock Enterprises, Limited, of New York, will operate a series of picture and vaudeville houses in Canadian cities, including Ottawa, Kingston, London, Hamilton, Winnipeg and Montreal. Jacob A. Jacobs, S. Friedman and Geo. S. McLeish, of Montreal, are the interested parties.

It is stated that the Earl Grey Skating Club will shortly erect an extensive club building and skating rink. It is understood that the Eadie property on Drummond street has been purchased for this purpose.

Mr. Theo. Daouts, architect, 103 St. Francois Xavier street, is preparing plans for an extensive amusement enterprise to be erected at Isle Grosse Bois, and expects to call for tenders next week.

Mr. Jos. Perrault, arcihtect, 2106 Park avenue, is preparing plans and details for the "St. Georges" apartments, to be erected at the corner of Park and Fairmount avenue, for Mr. George Poliquin. Mr. Perreault expects to have his plans and details completed by February 5th, 1910.

It is reported that the Royal Edward Hotel Company has been formed with a capital of $90,000. It is further stated that they have purchased the Carsley block which fronts on St. James and Notre Dame street, east of St. Peter street, and will remodel it extensively for use as an hotel.

The Yorkshire Insurance Company will erect a ten storey office building on St. James street, opposite St. Lawrence Hall, and adjoining the G. T. R. ticket office, at the corner of St. Francois Xavier street. The company will tear down the building now occupying the site, and as soon as spring arrives construction of a modern structure will be commenced. The building is to be completed about the 1st of May, 1911. Estimated expenditure, about $200,000. Architects, Saxe & Archibald.

The buildings occupied by the United Quick Shoe Repairing Company and other companies on St. Catherine street west, near the Casino theatre, were damaged by fire. Estimated loss, $25,000.

Quebec, Que.

It is understood that a starch factory will be established in this vicinity. Messrs. C. Amedee Paquet, 114 d'Aiguillon, and Jos. Falardeau, 271 St. Joseph street, are interested. Proposed site, Riviere aux Chiens, Chateau Richer.

Sprague, Man.

The C. N. R. station here was destroyed by fire on the 28th inst. Estimated loss, $3,000.

St. John, N.B.

The wood working factory of Hamilton & Gay was destroyed by fire on the 28th inst. Estimated total loss, [illegible]

Toronto, Ont.

In a recent issue of the "Contract Record" it was stated that the Standard Sanitary Manufacturing Company obtained a permit for the erection of a factory at the corner of Royce and Lansdowne avenues, Toronto, to cost $12,500. We understand that the company propose to spend a much larger amount in the erection of their buildings, and will have one of the most complete factories in Canada. The permit in question covers only one of the buildings forming part of the complete plan.

It is stated that the Home Bank of Canada has purchased the lot on the northwest corner of Broadview avenue and Elliott street. Col. James Mason, general manager.

It is stated that Mr. Richards has purchased the northeast corner of York and Adelaide streets, 128 feet on York by 105 on Adelaide. Plans for a large building, combining offices and stores, will be prepared, shortly.

Vitcoria, B.C.

It is stated that B. Williams & Company are planning improvements to their establishment on Yates street.

The Quaker Oats Company of American are reported to have concluded a deal with the Ashcroft Waterworks for the purchase of the latter property as a site for their Western Canadian manufactury.

The Dominion Trust Company interviewed the council in regard to the erection of a six storey building, on Wharf street, opposite the post office. Estimated expenditure, $150,000. Materials, stone, glazed brick, or terra cotta. President, J. B. Mathers.

A three storey brick building for stores and offices on land 60 by 120 feet is contemplated on Johnson street, adjoining the warehouse of the Brady-Houston Pickling Company. Estimated cost, $12,000. Owner, Dr. A. J. Garesche.

Vancouver, B.C.

It is stated that A. S. Marsh, of Calgary, has taken over the Astor hotel, which he intends to thoroughly remodel.

It is reported that a large saw mill will be erected here by the North Star Lumber Company, Elko, B.C. J. Hanbury is interested.

Tenders for the construction of the proosed Howe street addition to the Hotel Vancouver will be called for shortly. It is stated that $20,000 will be expended in remodelling the hotel at Sicamous Junction by the C. P. R.

Winnipeg, Man.

Tenders are being invited for the office building of Alloway & Champion, near the corner of Main street and Portage avenue, the plans of which are now completed.

The Western Canada Flour Mills Company, Limited, will erect large new elevators at St. Boniface, and at Goderich, Ont. The elevator to be built at St. Boniface will be commenced within the next two weeks, as the contract is expected to be let within that time. A. Kelly, president, and S. A. McGaw, vice-president.

AWARDED.

Montreal, Que.

Messrs. Peden & McLaren, architects, 17 St. Alexis street, have awarded the contract for the marble work required in the new office of the Bank of Montreal,, St. Johns, Newfoundland, to the Smith Marble Construction Company.

Shawinigan Falls, Que.

T. Pringle & Sons, architects, Coristine Building, Montreal, have awarded the general contract for the erection of a plant for the Shawinigan Cotton Company, Limited, to Mr. C. E. Deakin, of Motnreal. Contract for roofing has been awarded to Geo. W. Reed & Company; elevators, Otis Fenson Company; chimney, M. W. Kelog.

Victoria, B.C.

The contract for building the 70-room addition to the Empress hotel here has been awarded, it is reported, to J. L. Skene of this city.

Vancouver, B.C.

The contract for the excavation work for the proposed Canada Life Building on Hastings street, next to the Bank of Commerce building, has been awarded to McDonald, Wilson & Snyder, contractors for the new courthouse. A. A. Cox, supervising architect and designer of the Carter-Cotton building.

Power Plants, Electricity and Telephones

Blind River, Ont.

Preparations are being made by the Blind River Light, Heat & Power Company, for extensive improvements and additions to its system during 1910, which will include the construction of a new concrete power house and installation of an additional 300 h.p. turbine. Thomas H. Pindell is superintendent.

Edmonton, Alta.

The city of Edmonton is reported to have engaged Walter J. Francis, of Montreal, Que., Can., consulting engineer, to make a report on the power plant and other civic utilities.

The Edmonton Radial Railway Company, it is stated, expects to place contracts during the next six weeks for the construction of about three miles of single track and one mile of double track. Chas. E. Taylor, general manager.

Hespeler, Ont.

Plans are being considered to take electrical service from Niagara Falls, through the Hydro-Electric Power Commission, about May 1. It is proposed to install a synchronous motor to replace the present steam plant, which will be held as an auxiliary. When the change is made a power service will be established. W. Brewster is treasurer.

London, Ont.

February 26th has been fixed as the date for receiving tenders for electrical apparatus,, including transformers, motor, generator set, voltage regulators, switchboards, lightning protectors, instruments, arc and incandescent street lighting systems. Address E. I. Sifton, city electrical engineer.

Latchford, Ont.

In connection with the concrete dam to be constructed here, it is stated that a power plant is to be installed as the work progresses and electrical energy generated.

Medicine Hat, Alta.

Arrangements are being made by the Alberta Clay Products Company for the installation of a 500 h.p. power plant, the equipment of which will include three tubular boilers, Corliss engine, generator, pumps, heater, etc.

Montreal, Que.

The Montreal Light, Heat & Power Company, continuing its policy of burying its wires in conduits throughout the city, have decided to lay 60,000 feet of conduits between Mentana and Marie Ann streets, and between Orleans and Forsyth streets.

Ottawa, Ont.

The bill to incorporate the Toronto Central Terminal Company has been defeated by the Commons Railway Committee.

Preston, Ont.

The bylaw to raise $18,000 for the installment of the hydro-electric plant was carried by a large majority. Noted in issue of January 5th.

Saskatoon, Sask.

Tenders addressed to J. H. Trusdale, city clerk, will be received until February 14th for supply of the following material: 4 tons of No. 00 W. P. copper wire; 4 tons No. 2 W. P. copper wire; 4 tons No. 4 W. P. copper wire; 2 tons No. 10 W. P. copper wire; 2,000 1½ inch top pins; 3,000 D. G. D. F. insulators; 2,000 side brackets; 500 service insulators; 200 5-ampere meters; 100 10-ampere meters; four 30 kw. transformers; two 1 k.w. transformers; 50 lbs. tape; 500 feet olom, 3-4 inch; 20 lbs. solder; 10 pounds solder paste; 200 straine insulators; 400 fuses assorted; 500 5-8 by 15 inches for double arming, with both ends threaded and double nuts; 3,000 5-8 inch washers.

AWARDED.

Galt, Ont.

The contract for the equipment of the hydro-electric transform r station, it is stated, has been awarded to the Canadian General Electric Company, Peterboro.

Montreal, Que.

The Mississiquoi Marble Company have awarded a contract to Laurie & Lamb, of Montreal, for the installation of a 50 h.p. Bellis-Morcom engine to operate their new saw shop. The contract for twelve additional gang saws has been awarded to the Patch Manufacturing Company, of Rutland, New York.

Miscellaneous

Cornwall, Ont.

By-laws have been passed to issue $4,747 local improvement debentures. Geo. S. Jarvis, clerk.

Fort William, Ont.

Tenders addressed to Chairman of ''Utilities Committee'' will be received until February 24th for the supply of 7,000 standard railway ties, etc. Delivery to commence on or before April 1st, and full quantity to be in before April 15th. A. L. Farquharson, construction superintendent.

Tenders addressed to Chairman of Utilities Committee will be received until February 24th for the supply of 486 cedar poles, etc. Delivery to commence on or before March 15th and completed delivery before March 31st. A. L. Farquharson, construction superintendent.

Tenders are being called until 10th February for the supply of brass goods, lead pipe, pig lead and service boxes. For information apply at City Engineer's office. J. Wilson, assistant city engineer.

The West Algoma Agricultural Association are calling for tenders until February 7th for delivery of 500 cedar fence posts, each ten feet, six inches long, with a six inch top. Frank Lee, secretary-treasurer.

Hamilton, Ont.

The Works Committee passed estimates amounting to $356,000, as follows: Street lighting, $42,000; Board of Works, $107,000; sewers, $11,150; waterworks, expenses, $65,250; sewage disposal, $19,154; waterworks construction, $94,000; collection of garbage, $17,000.

Latchford, Ont.

The work of setting the concrete for the concrete dam to be constructed by the federal government will be started at low water in July.

Moose Jaw, Sask.

Tenders are being called for two street sprinklers until February 21st. J. D. Simpson, city clerk.

Montreal, Que.

Recent building permits include: C. Gauthier, 2516 Mance street, one house containing two dwellings, $2,500; W. J. Wall, 83 Bleury street, one house containing store and dwelling, $10,500; A. Beaulieu, 224 Boyer street, one house containing six dwellings, $4,500; W. Monasteese, 526 Chambord street, one house containing five dwellings, $4,500; F. Locas, 1167 Huntley street, one house containing two dwellings, $2,000; F. Touchy, 1907 Boyer street, four houses containing eight dwellings, $8,000; O. Michaud, 1590 A Labelle street, one house containing three dwellings, $2,000; P. Fortier, 2091 Hutchison street, one house containing three dwellings, $4,500; Ideal Savings, Loan & Land Company, 292 St. Catherine street east, six houses containing eighteen dwellings, $5,000; Jenkins Bros., Remi street, factory, one storey, at 103 St. Remi street, $5,000; Dubuc & Chateauvert, 1125 Delorimier avenue, house containing three dwellings on Cartier street, $4,000; F. X. Craig, 387 Mount Royal avenue, a three storey store on Notre Dame street west, $5,000; L. P. Dauphausse, 26 Dufferin street, house containing five dwellings on Papineau avenue, $5,000; H. C. Desaulniers, 1373 Parthenais street, house containing five dwellings on Papineau avenue, $5,000; A. Lusignan, 385 Plessis street, house containing five dwellings on Papineau avenue, $5,000; D. Murray, 75 Parthenais street, house containing three dwellings at 71 Parthenais street, $5,000; E. Dufresne, Credit Foncier Building, six houses, containing twelve dwellings on Dumont street, $10,000; W. M. Aitken, Drummond street, alterations to property corner Drummond and Sherbrooke street, $2,000; Mde. V. Joe. Levert, 596 Mount Royal east, alterations to property at 577 Mount Royal east, $6,000; J. A. Aumais, 1046 Sherbrooke east, alterations to 2063-71 St. Lawrence boulevard, $3,500; G. Paradis, 432 Joliette street, three houses containing nine dwellings on St. Germain street, $7000; T. Charpentier, jr., 157 Papineau avenue, two houses containing five dwellings on Papineau avenue, $8,000.

North Vancouver, B.C.

Tenders are being called until February 28th for the purchase of the following 50-year 5 per cent. debentures: Waterworks, $65,000; sewer, $40,000; school, $61,000; road machinery, $10,000; parks, $5,000; fire equipment, $3,000.

Ottawa, Ont.

Press reports state that the Commons Railway Committee has passed the bill extending the charter of the Montreal, Ottawa & Georgian Bay Canal Company, and it is said that the company is now prepared to go ahead with the construction of its canal.

Port Arthur, Ont.

It is stated that a committee of the city council has been appointed to develop a scheme for instituting a gas plant here, and an inducement will be offered several companies with whom the city has been in communication.

Smith's Falls, Ont.

Tenders addressed to J. A. Lewis, town clerk, will be received until February 7th for $4,660.21 20-year 5 per cent. local improvement debentures.

Strathcona, Alta.

On February 7th the ratepayers will vote on a by-law to issue $8,019 4 1-2 per cent 30 year debentures; also $50,000 40 years 4 1-2 per cent. bridge debentures. Chas. E. K. Cox, secretary-treasurer.

Victoria, B.C.

The management of the Victoria Ferry and Terminal Railway Company is said to be determined to procure from the new city council the permit necessary for the construction of new terminals and offices on Blanchard street.

Winnipeg, Man.

The following building permits have been issued recently: Northern Foundry & Machine Company, pipe foundry on Point Douglas avenue, north side, between Gomez and Gladstone, $10,000; H. Hirsh, two dwellings on Polson avenue, between Main and Mac street, $2,000 each; O. Sturster, two houses on Arlington street, between Livinia and Portage, $2,000 each; Mrs. G. Bradshaw, house on Park place, between Ashland and Florence, $3,000; Morgan & Daykin, five houses on Home street, between Livinia and Ellice, $2,000 each; Arni Eggertson, house on Home street, $3,500; J. Campbell, house on northeast corner of Lily and Alexander, $3,000.

AWARDED.

Fredericton, N.B.

We have been officially informed that the contract for lumber for Tobique Narrows steel bridge has been awarded to F. D. Sadler, of Perth, Victoria Co., N.B., at $18 per thousand. D. B. Winslow, secretary, Public Works Department.

Kingston, Ont.

H. Chadwick has been awarded the contract for four thousand barrels of cement at $1.69 as a result of further consideration by the board of works. The board decided at a previous meeting not to accept any of the tenders, believing they could secure a cheaper supply on the open market.

Latchford, Ont.

The contract for the Latchford dam has been awarded to W. H. Sinclair and D. B. Campbell, of West Toronto, at an itemized price of about $38,000.

Montreal, Que.

The Seaman-Kent Company, Limited, have been awarded the following contracts for flooring: Ashbury College, Ottawa, Byers & Anglin, contractor; Canada Life Building, Ottawa, Byers & Anglin, contractors; Carnegie Library, Peterboro, Rutherford Bros., contractors; Lake of Woods Building, Montreal, Simpson & Peel, contractors, architects, Ross & McFarlane; Catholic School, Wellington street, Joseph Jacobs, contractor; G. and J. Esplin, factory, Montreal.

Toronto, Ont.

Tenders have been received and opened, and contracts awarded for the following anual supplies required by the Works and other Civic Departments during the year 1910, viz.: Gravel, screened and unscreened gravel in carload lots, to the York Sand & Gravel Company; screened and unscreened gravel, east of the Don, John Foley, at $1 per cubic yard, the lowest in each instance; iron and steel, Baine & [illegible], and T. Meredith & Company, the lowest tenderers. General Supplies — [illegible], etc., Aikenhead Harware, Limited, Thos. Meredith & Company, and the Russell Hardware Company; broken stone, Rogers Supply Company, who have intimated their willingness to supply it in bins at $1.10 per ton; granite paving blocks, David J. Gordon & Son, Gananoque, Ont.; [illegible] blocks, both large and small, James Brodie, Graniteville, Que., the lowest paving blocks, Ontario Brick Company, the lowest; refined asphalt, the California Asphaltum Sales Agency (1,000 tons); limestone dust, to "Crushed Stone, Limited," at $5.35 per ton, being the lowest.

Victoria, B.C.

The contract for the sternwheel steamer for the Prince Rupert Skeena Navigation Company to ply between Prince Rupert and Hazelton has been let to the Victoria Machinery Depot at $40,000. The vessel is to be completed by April 20th.

The contract for the sternwheel steamer for the prince Rupert Skeena Navigation Company to ply between Prince Rupert and Hazelton has been let to the Victoria Machinery Depot, the contract price being $40,000. The vessel is to be completed by April 20th and will be built in Victoria.

New Companies

Superior Rolling Mills Company, Limited, Fort William, Ont., incorporated, capital, $500,000. Incorpoartors, M. J. O'Brien, G. H. Montgomery, K.C., both of Montreal, Que.

Sawyer-Massey Company, Limited, Toronto, capital $7,000,000, incorporated to carry on business as a manufacturer of and dealer in steam, gasoline and oil engines, and also in timber, wood and metal. Incorporators, J. S. Lovell, accountant, W. Bain, bookkeeper, and R. M. Coates, all of Toronto, Ont.

Dominion Corrugated Steel Pipe Company, Limited, St. Johns, Que., incorporated, capital $20,000. Incorporators, C. H. Richardson, manager, H. Proctor, merchant, of Sandusky, Mich, U.S.A.

Chateau-Richer Quarry Company, Quebec, incorporated, capital $85,000. Incorporators, J. W. Baker, hotel manager, J. E. Baker, quarryman, and C. E. Tachereau, notary, all of Quebec.

Saint Lawrence Car Works, Limited, Quebec, incorporated, capital $250,000. Incorporators, J. G. Scott, gentleman, A. E. Doucet, engineer, B. A. Scott, lumberman, all of Quebec, and C. L. Hervay, engineer and W. H. Ford, manufacturer, both of Montreal, Que.

Business Notes

D. Ross, contractor, London Township, is stated to have assigned.

Ville Marie Plumbing Company, Ville Marie, Que., is stated to have assigned.

Stalker & McKeown, electricians, Winnipeg, Man., are stated to have dissolved.

The Annex Hardware Company, St. Louis, Que., are stated to have assigned.

Hodgson & Stearman, hardware and plumbing merchants, Vancouver, B.C., have dissolved.

P. Legare & Fils, builders, Montreal and Three Rivers, are stated to have been asked to assign.

J. Gray, builder and contractor, Peterboro, Ont., is stated to have assigned to A. J. Warne.

The R. Watt Machine Works, Limited, Ridgetown, Ont., are stated to be removing to Chatham, Ont.

The Manitoba Gazette gives notice of the incorporation of the following companies: J. J. Crowe Company, Limited, Newdale, Man., incorporated to acquire, manufacture and deal in lumber, pulp, brick, building and construction material and supplies. Capital, $20,000. Incorporators, J. J. Crowe, lumber merchant, Newdale; R. J. Gourlay, manager, J. B. Sinclair, secretary, both of Winnipeg, Man.

Tenders and For Sale Department

Proposals

Tenders are wanted for approximately 8,000 k.w. of [illegible] Volt Transformers.

For information apply at once to ELECTRICAL DEPARTMENT, City Hall, Toronto, Canada. 5

City of Moose Jaw

Notice

Tenders will be received for two (2), two-horse street sprinklers, steel tanks.

Tenders stating capacity and weight, giving prices f.o.b. Moose Jaw, to be laid on the council table not later than 8.30 p.m., on MONDAY, FEBRUARY 21ST., 1910.

THE CITY OF MOOSE JAW
W. F. Heal, City Clerk.
7

Notice to Contractors

Tenders for 42 inch Steel Intake Pipe

Sealed tenders addressed to the Chairman of the Water Works Committee will be received by registered post only, up to 5 p.m., TUESDAY, FEBRUARY 15TH, 1910, for the supply and delivery of 3,000 lineal feet of 42 inch steel intake pipe.

Specifications, form of tender and full particulars may be obtained on application to the City Engineer's Office, City Hall, Ottawa.

The Corporation does not bind itself to accept the lowest or any tender.

NEWTON J. KER,
City Engineer.

Ottawa, January 24th, 1910. 6

City of Saskatoon

Tenders wanted

House, Sewer and Water Works Service Connections

Sealed tenders will be received at the Office of the undersigned City Clerk untill 5 O'clock p.m., MONDAY FEBRUARY 14TH, 1910, for certain materials required for House, Sewer and Water Works Service connections, including Sewer Pipe, Galvanized Iron Pipe, Lead Pipe, Brass Fittings, Service Boxes and Water Meters.

Instructions to Bidders may be obtained on aplication to George T. Clark, City Engineer.

The lowest or any tender not necessarily accepted.

WILLIAM HOPKINS, Mayor.
J. H. TRUSDALE, City Clerk.

Saskatoon, January 21st, 1910. 5

Tenders for Church

Tenders will be received by the undersigned until noon on SATURDAY, FEBRUARY 19, 1910, for the work of the various trades required in the erection of a church building on the corner of Queen Street West, and Beaty Avenue, Toronto, for the Church of the Epiphany.

The lowest or any tender not necessarily accepted.

GORDON & HELLIWELL, Architects,
6 Confederation Life Building, Toronto.

City of Saskatoon

Tenders Wanted

Steel Overhead Footbridge at Twentieth Street

Sealed tenders addressed to the undersigned City Clerk and endorsed "Tender A" and "Tender B" will be received, for the construction of a Steel Overhead Footbridge at 20th Street, until five o'clock p.m., on the following dates:

Contract A, Foundations, MONDAY, FEBRUARY 14TH, 1910.

Contract B, Steel Superstructure, MONDAY, FEBRUARY 21ST, 1910.

Plans and specifiations, etc., may be seen at the office of the City Engineer, Saskatoon; also at the office of the Canadian Engineer, at the following addresses:

Toronto, 62 Church Street, Phone Main 7404
Montreal, B33 Board of Trade Building, Phone M 1001
Winnipeg, Room 315 Nanton Building, Phone 8142

The lowest or any tender not necessarily accepted.

WILLIAM HOPKINS, Mayor.
J. H. TRUSDALE, City Clerk.

Saskatoon, January 21st 1910. 5

Notice to Contractors

Cast Iron Pipe

Sealed tenders addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, endorsed "Tender for Cast Iron Pipe, Main Drainage Works", willl be received by registered post only, until noon of TUESDAY, FEBRUARY 22ND, 1910.

Each tender must be accompanied by a deposit of $350.00, and a bond of $4000.00 will be required for the faithful performance of the contract.

The following are total of approximate lengths of the various sizes required under the contract:

465 lin. ft. of 42-inch Cast Iron Pipe
465 lin. ft. of 66-inch Cast Iron Pipe
160 lin. ft. of 36-inch Cast Iron Pipe
8 lin. ft. of 6-inch Cast Iron Pipe

The above lengths include all specials.

Specifications, form of tender and plans may be obtained from the Main Drainage Department, City Engineer's Office.

The usual conditions relating to tenders as prescribed by City By-law must be strictly complied with or the tender will not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman Board of Control.

City Hall, Toronto, January 27th, 1910.

Tenders

Whole or separate tenders wil be received by the undersigned up to FEBRUARY 14, 1910, for the erection and completion of a

Church Building

for the West Side Methodist Church, Owen Sound, Ont.

Plans may be seen at the store of A. W McFaul, 912 2nd Avenue east, Owen Sound, or at the office of the Architect, Jas. S. Russell, Stratford, Ont. The lowest or any tender not necessarily accepted.

JAS. C. MILLER,
Chairman Building Committee,
5 Owen Sound, Ont.

Tenders for

Gaol Heating

Tenders will be received by the undersigned up to noon on WEDNESDAY, the 16TH DAY OF FEBRUARY, 1910, for the heating of the County Jail at the Town of Barrie, according to plans and specifications which may be seen on application to A. W. Beardsley, County Clerk's Office, Court House, Barrie. All tenders to be sealed and marked "Tenders for Gaol Heating" and addressed to

C. J. PICOTTE,
Chairman County Property Committee
6 Box 128, Penctanguishene. Ont.

For Sale

A 60,000 gallon Water Tank on Steel Trestle, 90 ft. high.

Sealed tenders addressed to the Chairman of the Water Works Committee, endorsed "Tender for Water Tank", will be received by registered post only up to 5 p.m. TUESDAY, MARCH 1ST, 1910, for the purchase removal of a 60,000 Imperial Gallon Wooden Tank and mounted on a steel trestle, 90 ft. high, at the Ottawa East Pumping Station.

Particulars may be obtained on application to the City Engineer's Office, City Hall, Ottawa.

The Corporation does not bind itself to accept the highest or any tender.

NEWTON J. KER,
City Engineer.

Ottawa, January 25th, 1910. 7

Miscellaneous

TILLSONBURG, ONT.—Good opening for an Engineer and P.L.S. Town of Tillsonburg. Population 3,000. Town would require part of his services for Public Works. Apply to A. E. RAYNES, Town Clerk. 6

Fine Factory Site—New Westminster, B. C., the coming factory city Lot 7. Block 36; corner 198 x 132, three frontages; close to tracks and waterfront. Right in city, and already surrounded by industries. $15,000. Snap. Will bring double this inside two years. Investigate. Address P. O. Box 516, Vancouver—owner. 7

Canadian Sheet Steel Corporation, Limited, Toronto and Morrisburg, Ont., are stated to have assigned.

J. A. Gillis, of Gillis & Wall, lumber merchants, Halifax, N.S., is stated to have assigned.

The Canadian Automatic Air & Steam Coupler Company, Limited, Winnipeg, Man., capital $750,000. Incorporators, P. A. Seneeal, inventor, J. L. Nelson, contractor, and J. Delmage, all of Winnipeg, Man.

We Have Always in Stock:

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Crushed Granite and Crushed Stone

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Foot of Bathurst St. 256 Lansdowne Ave. G.T.R. Crossing Pape Ave.

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Standard Creosoted Railroad Ties

Capacity after March 1st, next, 1,200 ties per day.

Dominion Carbolineum Works Limited

Vancouver, B. C.

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is the

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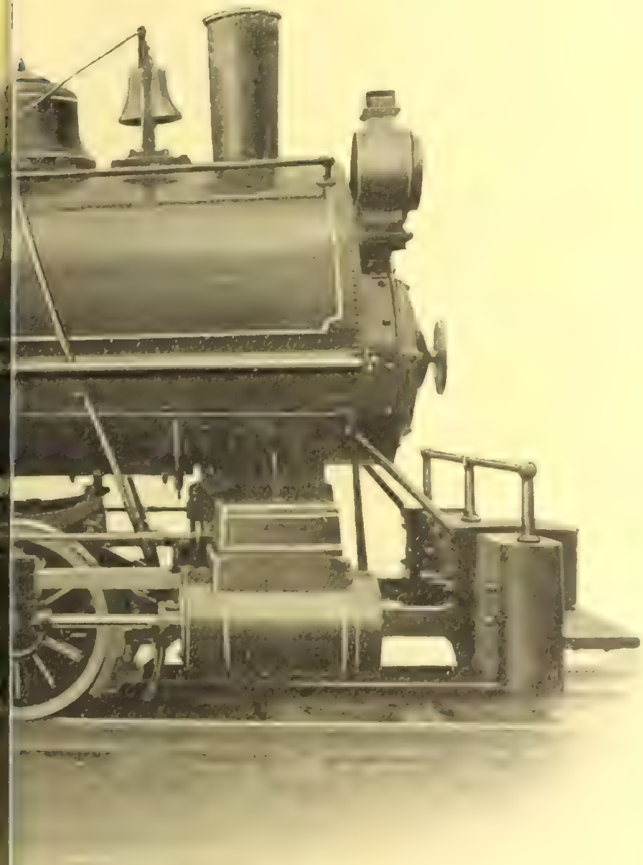

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Reliable for Heavy and Continuous Service.

LIMITED

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Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Vancouver - 614 Hastings St. W.

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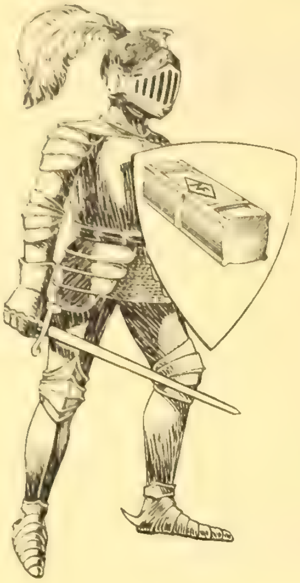

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Our trade mark is rolled in the bar every three feet.

The reason we brand our product is simply because we believe in it, and want to protect it in every way we can.

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We not only make the BAR, but we make also the STEEL the bar is made from. We are the only Steel Company in Canada which MARKETS DIRECT its **own** type of bar made from its **own** steel.

Absolutely no re-rolled metal is used by US. This is not a knock at competition, as it is pretty well known in the building trades that many mills **do use** re-rolled metal.

Consider, then, only the brand "NF" on the bar when making up specifications, and you will be safe.

ONTARIO IRON & STEEL COMPANY, LIMITED
Toronto, Ont., Canada

BRONZE ENTRANCE DOORS
Canadian Bank of Commerce, Vancouver.

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ol. 24 Toronto February 2, 1910 No. 5

ork of the Can. Soc. C. E.

The excellent work which is being done for the en ineering profession in this country by the Canadian ociety of Civil Engineers and the influence which this dy can and will command for the fulfilment of its rious purposes are matters that must have been borne very forcibly upon those who attended the 24th an ual convention of the Society at Ottawa last week.

Incidentally, the officers and council of the Society re to be congratulated upon the success of this meet ig. We believe that we shall be casting no aspersions pon the efforts made in the past when we say that in oint of enthusiasm, the convention was the best ever eld; and we feel safe in the assertion that never be re was a meeting productive of greater promise inso r as are concerned the fundamental, vital things for hich the Canadian Society of Civil Engineers was in rporated, and for which it is working so faithfully.

The unsatisfactory status of the civil engineer in the rvice of the government is a question that was pro ounded most ably by Mr. Dodwell, of Halifax, resi nt engineer for the Department of Public Works, the reater part of whose address is reproduced elsewhere this issue. While we are hardly prepared to say hat in the framing of the Civil Service Act there was iscrimination, of "d [illegible] ign and intent," against the civil gineer, we are [illegible] inced that under present condi ons the professi[illegible] not receiving proper recognition nder its provisi[illegible] he appointment of a special com ittee of the [illegible] make due representations to e governme[illegible] timely. It is a serious reflec on upon t[illegible] that under the absence of proper regulations the engineer seeking government work is required neither by examination nor testimonial to show his ability to undertake his important and responsible duties. Surely in the development of recent years we have had ample proof of the necessity for a high standard of engineering skill! How then is it conceivable that the present conditions still obtain, and upon whom is the blame attached? The Society will, doubtless, be able to throw some elucidation upon these matters long before the next annual meeting, and it is certainly about time that some investigations were made, for of all the problems of the past, present and future that have to be solved in the development of the country few, or none, are of greater importance than those pertaining to engineering. Mr. M. J. Butler, in the course of his remarks, declared that civil engineers were "the most important factor in modern civilization," and that in view of the important part it takes, the profession is worthy of better recognition.

The expansive nature of the Society's work is attested by the ready assistance given the Conservation Commission in the appointment of members in every province to co-operate in the excellent work of the Commission. The latter body will be greatly strengthened by the engineers, and their observations should be extremely helpful in the development of the work.

The address given by Mr. Mountain, the retiring president, will be read with interest by many of our readers. Mr. Mountain is a gentleman of mature experience, and the views he holds in regard to the supreme importance of transportation problems will be shared by all who are really competent to express an opinion on the point. The "network of steel" now being spread over Canada is undoubtedly one of the greatest factors in the development of the country. With a continuation of a progressive policy on the part of the government and the railway companies, the solution of the present transportation problems will not be difficult to find. It is significant to note that Mr. Mountain considers that we have now entered upon perhaps the greatest year of railway development in the history of our country.

The Canadian Society of Civil Engineers was designed primarily to promote the interests and raise the status of the engineering profession, and for what it has already done in these respects it is entitled to the support and co-operation of every individual engineer throughout the Dominion. But one may ask: What good resulted from the convention? Well, if it did nothing else it brought some 250 of the most prominent members of the profession into close fellowship and to a better understanding of one another. Among engineers, as in every other community, the spirit of unity and esprit de corps is a great desideratum. This spirit is fostered at the annual meeting. The more engineers get together in a friendly spirit, the better the results that will be worked out, both for themselves and for the profession at large. The convention provides the time, the place and the mood, generally, for discussing not only the plans of the corporate body, but also the peculiar difficulties of the individual practitioner.

At the annual meeting of the Quebec branch of the Canadian Society of Civil Engineers, Capt. A. E. Doucet was elected president in succession to Mr. A. L. Val[illegible] Mr. F. B. [illegible] succeeds Mr. O'Donnell [illegible] tary of the branch. Messrs. E. A. Hoare, DeCary and A. Leofred are new members of the council. After the meeting, which took place at the City Hall, the members enjoyed a pleasant reunion in the office of Mr. Leofred.

24th Annual Meeting of the Can. Soc. C.E.

Detailed Account of the Convention at Ottawa last week — Representative Gathering Enacts much Useful Work — Many Interesting Addresses

The 24th annual convention of the Canadian Society of Civil Engineers was held in the council chambers of the City Hall, Ottawa, from the 25th to the 27th ult. The meeting was representative of the best interests of the profession throughout the Dominion and was attended by over 250 members and others closely identified with engineering and allied interests.

The complete list of those who signed the register is as follows:—

Geo. A. Mountain, Ottawa.
A. A. Dion, Ottawa.
M. Donaldson, Ottawa.
T. C. Keefer, Ottawa.
Newton J. Ker, Ottawa.
J. B. McRae, Ottawa.
A. St. Laurent, Ottawa.
A. H. N. Bruce, Ottawa.
Wm. J. Stewart, Ottawa.
Wm. P. Anderson, Ottawa.
N. J. F. Cauchon, Ottawa.
C. H. McLeod, Ottawa.
Fred'k H. Fay, Boston.
J E. Schwitzer, Wininpeg.
Louis Vallee, Quebec.
W. Dale Harris, Ottawa.
D. L. McLean, Ottawa.
A. Hector Dion, Ottawa.
Wm. Kennedy, Jr., Montreal.
John Kennedy, Monteral.
E. A. James, Toronto.
G. A. Bernasconi, Antigonish, N.S.
R. W. Farley, Hull.
H. N. Ruttan, Winnipeg.
Mrs. Ruttan, Winnipeg.
T. K. Thomson, New York.
Mrs. K. Thomson, New York.
S. B. Clement, North Bay.
E A. Stone, Fredericton.
F X. T. Berlinguet, Three Rivers.
Geo. F. Perley, Ottawa.
Earnest Marceau, Montreal.
Chas. S. Leech, Montreal.
Alex. Gray, Ottawa.
Wm. J. DeWolfe, Edmundstone, N.B.
H. V. Brayley, Ottawa.
R. Steckel, Ottawa.
H. D. Lumsden, Ottawa.
C. G. Keyes, Ottawa.
H. W. Jones, Ottawa.
L. N. Rheaume, Ottawa.
Collingwood Schrieber, Ottawa
Ed. F. Perreault, Ottawa.
J. K. Scammell, St. John.
Chas. McGreevy, Ottawa.
A T. Genest, Ottawa.
H. J. Heygate, Ottawa.
Claude V. Johnson, Ottawa.
W. M. Everall, Ottawa.
H. H. Pinch, Ottawa.
J. R. Grant, Ottawa.
F. M. Davis, Ottawa.
C. C. Kirby, Ottawa.
L. E. Allen, Ottawa.
W. Bell Dawson, Ottawa.
F. D. Anthony, Montreal.
L. A. DesRosiers, Ottawa.
E. V. Johnson, Ottawa.
C. R. Coutlee, Ottawa.
J. S. Armstrong, Rothesay.
P. E. Amiot, Father Point, Que.
[illegible]. Marchington, Toronto.
W. M. Ogilvie, Ottawa.
D. F. Maxwell, St. Stephen.
V. Denis, Ottawa.
E. J. Walsh, Ottawa.
P. E. Moffet, Ottawa.
F. R. Burgess, Ottawa.
Wm. A. Duff, Ottawa.
G. C. Carman, Cornwall.
H. A. F. MacLeod, Ottawa.
F. A. Drought, Ottawa.
A. R. Ketterson, Ottawa.
Chas. O. Wood, Ottawa.
F. E. Patterson, Ottawa.
A. M. Jones, Ottawa.
A. P. Deroche, Ottawa.
M. Wolff, Quebec.
J. A. Freeland, Quebec.
F. E. Bryant, Montreal.
H. A. Bogart.
M. S. Blaiklock, Montreal.
Geo. Janin, Montreal.
A. Janin, Montreal.
R. W. Hannaford, Montreal.
M. Neilson, Montreal.
Prof. L. A. Herdt, Montreal.
J. Duchastel, Montreal.
G. S. Maunsell, Ottawa.
H. F. Cole, Ottawa.
Walter J. Francis, Montreal.
W. V. Taylor, Montreal.
W. N. Dietrich, Ottawa.
G. K. McDougall, Montreal.
F. T. Kaelin, Montreal.
R. McColl, Halifax.
P. Charlton, Montreal.
J Aylen, North Bay.
F. O'Gara, Ottawa.
Chas. Baker, New York, N.Y.
H. R. Ives, Montreal.
E. A. Ghysens, Montreal.
J. H. Devey, Montreal.
E. O'Sullivan, Montreal.
A. McCulloch, Montreal.
J. Ewing, Montreal.
J. F. Blanchard, Ottawa.
I. D. Taylor, Ottawa.
Gustav Lindenthal, New York, N.Y.
Sir Sandford Fleming, K.C.M.G., Ottawa.
G. W. N. Day, Toronto.
C. E. W. Dodwell, Halifax.
Geo. S. Proctor, Ottawa.
E. G. Evans, Hampton, N.B.
H. J. Lamb, London.
Aime Cousineau, Ottawa.
Donald A. White, Ottawa.
R. Weddell, Trenton.
R G. Weddell, Toronto.
Donald S. Barton, Levis.
Wm. Young, Ottawa.
Alex. Hutchinson, Ottawa.
H. H. Houser, Ottawa.
Wilfrid S. Lawson, Ottawa.
W. de Courcy Topley, Ottawa.
John Murphy, Ottawa.
H. T. Barnes, Montreal.
G. B. St. Pierre, Ottawa.
C. M. Macreath, Sault Ste. Marie.
G. C. Rainboth, Aylmer, Que.
J. B. Spence, Ottawa.
Duncan McPherson, Ottawa.
T. C. Irving, Jr., Toronto.
Jas. Lamoureux, Ottawa.
John H. Bryne, Ottawa.
W. F. M. Bryce, Ottawa.
G W. Volckman, Ottawa.
F. R. Wilford, Lindsay.
F. B. Fripp, Sault Ste Marie.
V. A. G. Dey, Montreal.
R. W. Bishop, Owen Sound.
A. T. McDougal, Ottawa.
J. W. LeB. Ross, Sault Ste. Marie.
A. Leofred, Quebec.
Ernique Ortiz, Ottawa.
E. Jodone, Ottawa.
E. Ashton Hassan, Ottawa.
Wm. McNab, Montreal.
S. J. Chapleau, Ottawa.
J. J. Collins, Ottawa.
I. J. Steele, Ottawa.
R. F. H. Bruce, Ottawa.
Henri Melancon, Ottawa.
A. T. Pinet, Ottawa.
E. V. Collier, Ottawa.
M. F. Cochrane, Ottawa.
Douglas H. Nelles, Ottawa.
J. Galbraith, Toronto.
J. G. Sing, Toronto.
W. P. Merrick, Fort William.
P. G. Kelly, Montreal.
H. S. Greenwood, Peterboro.
G McL. Pitts, Ottawa.
W. L. Johnson, Rochester, N.Y.
A. Lightall, Ottawa.
Ormond Higman, Ottawa.
Henry L. Sherwood, Ottawa.
R. O. Sweezey, Quebec.
C. H. Pinhey, Ottawa.
F. P. Shearwood, Montreal.
Paul T. C. Dumais, Hull.
John B. Harven, Ottawa.
O. P. Schrieber, Ottawa.
P. B. Whitney, Ottawa.
A. J. Morris, Ottawa.
L. W. Gill, Kingston.
A. T. Tomlinson, Matheson.
R. deB. Carriveau, Ottawa.
J. L. Weller, St. Catharines.
F. H. Peters, Ottawa.
W. W. Benny, White River.
H. B. R. Craig, Kingston.
B H. Fraser, Ottawa.
P. E. Parent, Quebec.
F. Anderson, Ottawa.
G. H. Garnot, Ottawa.
L G. Papineau, Sorel.
H. A. Terreault, Sorel.
A. T. Fraser, Ottawa.
A. McDougall, Ottawa.
G. T. Desbarats, Ottawa.
W. Thomson, Ottawa.
J. B. Challies, Ottawa.
W. C. Gillis, Ottawa.
G. S. Macdonald, St. John.
John J. Murphy, Ottawa.
A. W. Achtar, Ottawa.
T. C. Keefer, Jr., Ottawa.
A. T. Phillips, Ottawa.
A. H. W. Cleave, Ottawa.
Russell Smart, Ottawa.
F. J. Hetherington, Ottawa.
F. D. Henderson, Ottawa.
Alex. J. Grant, Peterboro.
Jas. A. Beatty, Peterboro.
Amedie Buteau, Montreal.
J. Alf. Belanger, Montreal.
C. D. Sargent, Cornwall.
M. J. Butler, Ottawa.
T. C. Keefer, Ottawa.
H. A. Woods, Montreal.
O. Sullivan, Ottawa.
Frederick Lambart, Ottawa.
O. W. Smith, Toronto.
E. G. McLean, Montcon, N.B.
C. H. Mitchell, Toronto.
J. A. Jamieson, Montreal.
J. Macphail, Ottawa.
P. Johnson, Montreal.
C. A. Mathewson, London.
W. B. Russel, Toronto.
R. W. Leonard, St. Catharines.
H. C. Kennedy, Montreal.
Henry Holgate, Montreal.
E. G. Henderson, Windsor.
E. T. Agate, P. Hoford, N.Y.
A. Ghysens, Montreal.
G. A. Bayne, Winnipeg.
Gordon Grant, Ottawa.
W. R. McDonald, Alexandria.
H. de Miffonis, Ottawa.
De Gaspe Beaubiens, Montreal.
W. R. Duckworth, Montreal.
A. Boyer, Montreal.
C. M. McCreath, Sault Ste Marie.
Harry S. Day, Ottawa.
E. W. Berry, Toronto.
J. de C. Davies, Cornwall.
H. B. Stuart, Montreal.
Miss H. A. Stuart, Montreal.
Willis Chipman, Toronto.
H. F. Tye, Montreal.
G. W. Tornroos, Ottawa.
W. H. Bowden, Ottawa.
C. T. Trotter, Ottawa.
G. H. Duggan, Ottawa.
A. J. Matheson, Ottawa.
C. L. Herney, Montreal.
G. L. Mattice, North Bay.
K. H. Smith, Prince Rupert.
John T. Farmer, Montreal.

Tuesday, January 25th

The proceedings opened on Tuesday, January 25th, with a meeting in the council chambers for the nomination of scrutineers, reception of reports of council and committees, and general business. At the outset, objection was taken by Mr. Leach to the practice of calling a meeting of the newly elected council immediately upon the adjournment of the annual convention. Mr. Leach contended that the new council should not meet until every one had been properly notified and given an opportunity of attending. No ruling was made on the point other than that the matter could be re-opened nder the consideration of general business. (The ques-ion was subsequently re-opened and withdrawn.) The emainder of the morning session was devoted prin-ipally to the reception and adoption of the reports of ouncil, special committees and branches. In connec-ion with the report of the first-named body objection vas taken to the following clause:

"The council has called the attention of the Prime inister for the Province of Quebec to the importance f appointing a qualified engineer as a member of the roposed Public Utilities Commission for the Province, nd it has also suggested to the Citizens' Committee of ontreal the desirability of naming an engineer as one f the candidates for the new Board of Control. It otes with approval the nomination of Mr. F. L. Wank-yn as one of the committee's candidates."

The concluding paragraph was finally amended to ead: "It notes with approval the nomination of an ngineer and member of the society as one of the com-ittee's candidates."

A satisfactory financial standing was shown by the eport of council. The receipts amounted to $16,578 gainst a total expenditure of $12,431. The member-hip was reported at 2,659.

In May last the committee on the establishment of esting laboratories waited upon the Minister of Public Vorks and at his request prepared a memorandum mbodying the suggestions of the committee in regard o the project in hand. This memorandum was sub-nitted to the Minister on June 18th last. Following s an extract therefrom:

The New President: Col. H. N. Ruttan, City Engineer of Winnipeg.

"The Council of this Society is of opinion that the stablishment of a completely-equipped testing labora-ory by the Government for the investigation of struc-ural and other materials, including models and por-ions of completed structures, would be a wise and economical undertaking for the Government, which is he largest consumer in Canada of structural materials t would also be of great benefit to the public at large hrough the printed reports of the results of the inves-igations.

"The Council desires to draw attention to the work which has been done, and is still being prosecuted in this direction, by the American Government through the establishment of a very fully-equipped testing laboratory at St. Louis, and of another at Pittsburg, with provision for tests of very large steel members of bridges, etc.

"There is a great variety of Canadian structural material, about the physical properties of which very little is definitely known. If the characteristics of the materials were defined by the investigations of a well-organized Government laboratory, the results would not only be of value to the Government in the construction of its public works, but would also be to the advantage of works undertaken by private enterprise.

Mr. Geo. A. Mountain, of Ottawa, the Retiring President.

"The establishment of a central Government laboratory, with a permanent staff of specialists, should result in economy to the Government, as all departments would have the investigations and tests required for their work made therein, and outside expenses would be reduced to simple provision for field testing."

This memorandum was duly acknowledged and consideration promised, but it reflects little credit upon the Government officials to learn that no further progress has been made. The project is a most important one and one which the Society has very much at heart. At the afternoon session a resolution was carried "that the committee on the establishment of testing laboratories be continued, and that they be instructed to urge upon the Government, through the council, the desirability of appointing a commission to visit the United States Government testing laboratories at St. Louis and Pittsburg and also government laboratories in other places, for the purpose of gaining the necessary information precedent to the establishment of a Canadian laboratory."

Considerable interest is attached to the report of the sub-committee on rails, fastenings and tie-plates. This is reproduced in full in another column.

At noon the convention received an official welcome from Mayor Hopewell, who expressed the hope that the time spent in the capital city might prove both pleasant and profitable. President Mountain responded in suitable terms. Shortly afterwards the delegates were addressed by Sir Sandford Fleming, who said in part:

"For nearly half a century I have been a member of the American Society of Civil Engineers. Not quite so long as that a member of this Society, for it has not been in existence that length of time. It has been my privilege to witness a great deal of the engineering service which has taken place between the Atlantic and the Pacific, and I think I may be permitted to welcome the younger men to a noble profession. You belong to a profession of the first order. Although it is essentially a practical profession, you will find that its members cannot be too learned. Whatever has been done by engineers in the past, and whatever is doing to-day, I can see a wide field for this profession. There are between the oceans which bound Canada on three sides, great engineering problems which have to be solved in the development of our great inheritance—that inheritance which has been freely given to us by the great mother of nations for our children and our children's children to occupy and enjoy."

The City Hall, Ottawa, the headquarters of the Convention.

At 1.30 p.m. a complimentary luncheon was given by the members of the Ottawa branch in the dining room of the Russell House. A hearty vote of thanks was accorded to the Ottawa branch on this occasion, the visiting members showing their appreciation by musical honors.

Upon the resumption of business in the afternoon, a committee, composed of T. C. Irving, jr., E. A. James, R. S. Lea, O. W. Smith and N. J. Ker, was appointed to frame standard specifications for cast iron water pipe and to report to council, the latter body having full power to deal with this report. The balance of the day was taken up with further discussion of the various reports. In the course of the afternoon an eloquent tribute was paid to Mr. Keefer, sr., by Mr. Dodwell, of Halifax.

On Tuesday evening an enjoyable "smoker" was held in the council chamber of the City Hall. There was a good attendance and every provision had been made for the entertainment of the members. An excellent musical programme was provided. Addresses were given by Mr. Geo. A. Mountain, the retiring president, Mr. Dodwell, Halifax, resident engineer Department of Public Works for Nova Scotia, and Mr. M. J. Butler. President Mountain's address is reproduced in full another column.

Mr. Dodwell referred to the speech made in the House of Commons by Mr. Warburton, M.P., who was "the first to take up the cudgels in the House for the civil engineers." Efforts to improve that department in the past had met with indifferent success. Continuing, Mr. Dodwell said:

"No more important subject has come before the Society since its organization—and this not because a good number of the members are in the Provincial or Federal Governments, but because of the functions of the Society to guard the profession as a whole. I am convinced that no more serious subject could engage the attention and the strenuous endeavours of the members of the Society.

"In a letter to Senator Power I explained the disabilities and the anomalous position of the civil engineer of the Federal service, and from this letter I shall quote to a considerable extent.

"The objects in view are: First, a higher professional standing for the civil engineers in the service; secondly, a recognizzed official status with enrolment in the civil service; thirdly, a system of pensions and superannuation.

"First as to the standard. No standard whatever at present is required, and the engineers in the Government service are not conspicuous by superiority over the engineers not in the service. They are not obliged to pass an examination or to produce testimonials. Any of them may be put into a position of responsibility where wise expenditure or waste will result according to his ability and common sense or his absence of these qualities.

"In the Department report of the Public Works you will find the names of caretakers, stationary engineers and others, but not those of civil engineers. We are not looking for advertising, but I just wish to mention the fact. If there were proper organization, the civil engineering department would be one of the most profitable institutions in the country, considering the capabilities of engineers and the industrial advantages. I believe I may speak for the Society when I say that no civil engineer should be appointed to the civil service unless he is a member in good standing of this Society.

"Now as to enrolment. There are more or less temporary evils to be discarded. No provision is made for a corps of engineers in the Federal service. The Civil Service Act has always excluded civil engineers and it looks as if the exclusion were by design or intent. There is no reason why engineers should not enjoy security of tenure and the other privileges enjoyed by other officers for whom the Civil Service Act was passed. No engineer outside of Ottawa, whatever rank he holds, may be put on the civil list as an engineer. To determine just how the civil service stands would require an exhaustive study of nine acts, and I do not intend to weary you with them. Since the first act was passed in 1876, there has been discrimination against the profession. A man should be equally a servant of the Government, whether he is in Ottawa, Vancouver or Halifax.

"Why should an engineer with a salary of $2,000 or $3,000 in any of these places be excluded from the list, while a junior third class clerk in Ottawa getting $300 a year is admitted? The whole Act should be swept from the statute books, the distinction between outside and inside service abolished, and all brought under one category and one harmonious system.

"In the Public Works Department, out of one hundred engineers, only three are on the civil list, and they appear not as engineers but as clerks. I thought the work of the Commission would have been of a reformative nature. When a bill was brought down in Parliament, I felt the fruit was on the bough. Respecting the distinction between the outside and the inside service, the latter is subjected to more obscurity than before. Perhaps our discussion may bring about the consummation devoutly to be wished or at any rate result in our being given a hearing.

"The third object is pensions and superannuation. Under existing conditions there is no provision for the widow or family of an engineer dying in the civil service. There are a number of engineers in the Public Works, and Railway and Canals Departments whose periods of office have been from fifteen to forty years. Any of them who have not made investments out of their salaries or taken out insurance, may not leave enough to keep their widows decently. Some will say that the engineer enters the service with his eyes open and therefore he should be thrifty and put aside what he can spare or a little more.

"The widows of others enjoy a pension when the bread winners are taken from them. Why should so much more be expected in the case of engineers? The only resource for Government engineers is to die in harness before they are stricken by illness, and thereby secure to those they leave behind two months' pay. Those who have been longest in the service should be retired at two-thirds' pay. I should have no complaint if other employees of the Government were in the same circumstances as Government engineers. It is because the discrimination is unjust, ungenerous and, to my mind, remedial, that I am disturbed. I do not see why something along actuarial lines could not be done for the purchase of annuities on the retirement of an engineer or for his widow on his death."

Mr. Dodwell gave a hypothetical instance of where the government in the construction of a big work might while saving $20,000 or $24,000 in salaries in four years, pay one million dollars more for work badly done. He spoke of the achievements of the Public Works Department in India and Australia, and said that there was no reason why engineering should not be more successful in Canada, which was—or would be—the greatest country on the footstool. He urged that a committee be named to draft a memorial to Sir Wilfrid Laurier and the Cabinet, setting forth the claims of the Society. President Mountain promised that a committee should be named on Thursday. Mr. Leofred urged that delegations to the Government be composed, as far as possible, of civil engineers not in the service.

Mr. M. J. Butler, late Deputy Minister and Chief Engineer of Public Works, gave an interesting address dealing with the status of the engineer.

"The civil engineers," said Mr. Butler, "are the most important factor in modern civilization. The engineering profession is all absorbing. No other profession possesses this quality as it does. The profession of law, though requiring much learning, is not so absorbing. The lawyer is not in such close communication with the laws of nature.

"The engineer goes out into the community to take an important part and the profession is worthy of more notice. I must say, though, that the engineer himself is much to blame. He is too liable to let the scientific take up his whole attention, to the exclusion of the practical. Sometimes when he comes to the crux of a situation he will pass it aside saying that it belongs to the financier or the lawyer.

"This will explain why the general community is not able to get into intimate communication with the profession. Men who have some important work to be done, realize that they must call on the engineer for the theoretical or technical operations, but look for a more practical man for the carrying out of the work to completion. A distinction has grown up between the theorist and the practical man. Young men sometimes come from college with a smattering of engineering, a pseudo-scientific knowledge, which throws discredit on the profession.

"Truly, the civil engineer should be practical as well as scientific. Those of the profession in Canada should be among the best in the world. We in Canada are in a peculiar geographical position. It would look, judging by this position, as if the Maritime Provinces should mark it with the New England States. There is separation from Quebec by a large barren territory. A long haul is involved and even after the fertile Province of Ontario is crossed there are thousand mile stretches to the Rockies. The transportation question requires a higher degree of skill on the part of the engineer in Canada than in any other country. If we fail to do our part, I dread what the political future of this country must be. It is essential that the transportation problem in Canada be worked out on east and west lines, and not north and south, if foreign territory is to be avoided.

"I hope the young men will take some of these ideas home and think them over. The lack of business acumen on the part of the engineer is something that I wish to emphasize. The late Mr. Wellington said that a good engineer could do for one dollar what another might do for 'some price.'"

President Moutain's Address

In closing my year as President of the Canadian Society of Civil Engineers, I desire to express my appreciation of the honour which has been conferred upon me and of the personal consideration of the members. My interest in the welfare and

An Interesting Group of Members and their Friends assembled in front of the City Hall on the First Day of the Convention.

future of the Society will always continue, and I shall be ready to add my efforts to those of the other members for its advancement.

I am pleased to be able to report the continued growth of the Society, in the ranks of which are now included practically all the engineers of the Dominion in every branch of engineering. During the past year we have added two hundred and forty members and students to our rolls; so that we now have a total membership of two thousand five hundred and sixty-nine, of which the Honorary Members, Members, Associate Members, and Associates number fourteen hundred and five, and Students eleven hundred and sixty-four. This must be very gratifying to the members of the Society, and is of interest to the country at large, in that it shows a marked advance in all branches of engineering, which are so closely connected with the development of Canada.

The Canadian Society of Civil Engineers is an organization national in character, aim, and outlook, and is of recognized high standing. It must grow and increase in influence. The Society, as you are aware, some years ago formed itself into four sections: General, Electrical, Mechanical, and Mining. The object in view was to centralize the interests of the different departments of engineering and enhance the attractiveness of the meetings to those especially concerned in only one branch of the profession. While the home of the Society is established in Montreal, where practically all the business is transacted, the occasional change of place for the Annual Meeting has, in my opinion, served to join the men of the far east and the far west with their brothers of the great middle country. The formation of our local branches, which extend from the Pacific Ocean to the tide-waters of the Atlantic Ocean, while preventing decentralization, has done much to reconcile diversified views. The prime reason for the organized existence of the Society is to afford an opportunity for interchange of views on matters of interest to the members, thereby facilitating the advancement of engineering knowledge and benefiting not only themselves but also the community at large.

In order to give effective assistance in the advancement of engineering practice, it is important that we contribute to the work of our committees, so that their reports may be exhaustive and conclusive. It is not expected that these reports shall be final, as this would leave no room for improvement and further development. The reports should express the combined judgment of the members of the committees with regard to the practice which it desires the Society to approve, keeping always in mind the fact that such approval is subject to revision as circumstances justify.

Canada's great problem to-day is transportation. While the possibilities and even the necessities of water transportation in Canada are great, the problem will, I think, be largely solved by the network of steel which is being rapidly spread over the country.

We have without doubt entered upon one of the greatest years, if not the greatest, of railway development in our country. This is noticeable not only in regard to additional mileage, but particularly in the tremendous increase of motive power now being applied in the operation of railorads. Locomotives have been designed and put into use of a size that a few years ago would not be thought of, and, in addition to this, railway gradients have been reduced at enormous expenditure. These grade reductions are such that they have more than doubled the haulage capacity for a given engine.

In the development of water power, Canada, from one end of the country to the other, has made phenomenal strides. We constantly read of new water power construction and the resulting increase in the industrial development of the country. There has also been great progress made in the electrical transmission of energy from the centres of our water powers. Only a few years ago high tension transmission power lines were operating at a maximum of 30,000 volts, while this year the Hydro-Electric Commission of Ontario is constructing lines carrying 110,000 volts. In the application of electrical construction to railroads, the great improvement and added comfort in travelling is very noticeable, especially in tunnels, where trains are not now detained on account of gases generated by the coal-burning of the locomotives.

In the mining industries of the Dominion great strides have been made by the mining engineer, particularly in the construction and installation of machinery designed to handle in the most economical manner the riches beneath the soil. These new appliances have made it possible to develop properties which, in the days when only the pick and shovel were used, were without value, owing to the great cost of these old methods. Civil engineers engaged in municipal works have shown great advancement in the construction of waterworks, the proper disposal of sewage, and notably in the construction of roadbeds and pavements of all descriptions of highways.

In bridge engineering the problems which now face us are stupendous. Members of the Society are engaged in the building and construction of bridges with spans of 1,800 feet, in which also occur some most complex problems in substructure. The strength of bridges has been largely increased; in my own experience, almost threefold. It was said some two years ago that nearly everything had been discovered or invented except the flying machine and the North Pole. Since that statement was made the North Pole has been explored and flying machine construction rapidly advanced. I venture to predict that the progress of scientific engineering will in the next fifty years exceed that of the past fifty, great as that has been. Problems in engineering at which we now stand aghast will come to be matters of every-day practice. The members of the Canadian Society of Civil Engineers have undoubtedly lived up to the motto of the Society, whereby the great sources of power in Nature are converted, adapted, and applied to the use and convenience of man. The world owes more to the profession of engineering than to all the other professions combined.

I now wish to say a few words on the subject which, at the present time, is most interesting to me in my professional work. I refer to my connection with the Engineering Department of the Board of Railway Commissioners for Canada, of which I have the honour to be the chief. You are no doubt aware that the Board of Railway Commissioners was formed for the purpose of dealing with matters relating to railway construction, maintenance, operation, and traffic. The Engineering Department of the Board has to deal with construction and maintenance, and it is in regard thereto that I wish to speak specially. After a great deal of care and research, rules and regulations of the Board, specifying the proper method of presenting and filing plans, profiles, and details of all works in connection with railway matters, were drafted and aproved. Plans of location of railways are now coming to the Board in great and apparently increasing volume from all parts of the Dominion. The Engineering Department, in examining these plans, has in view the following: That no infringement on other locations are allowed; that the proper location of railways over all streams has been observed; and that there is no interference with adequate drainage of the country. In connection with bridge work, the strain sheets are checked to see that they are in accordance with the standard specifications. After the plans of the bridges have been approved, the completed structures are inspected on the ground to see that the plans have been carired out.

All plans, which are forwarded to the Board with applications of railways for the crossing of highways, are examined to see if the crossing is a proper one, and to endeavour to obtain grade separation in order to carry the railway over or under the highway, as the case may be. In addition to the above, many cases are also submitted, both by railway companies and municipalities, for the purpose of safeguarding the public by the application of grade separation to these thoroughfares. Scores of highway crossings are examined monthly by the engineers of this Department, and voluminous reports are made on the subject of eliminating grade crossings. In the older parts of the country, railway development in some places has reached a stage at which, on account of the great number of intersecting lines, care must be exercised in order to make these railway crossings separate by means of overhead or subway construction. Such construction is, of course, not yet possible in the prairie country of the west, where the ground does not lend itself to these conditions.

Great care is taken in the crossing of railways by high power electric transmission lines, in order to protect the public from dangers that might arise by breakage of these power lines. Such accidents are minimized by the construction of cables of reduced spans and greater tensile strength. The construction of all classes of conduits under the railway roadbeds for the conveyance of water, gas, and drainage is also a matter which demands close inspection. All plans of these are carefully looked into, so as not to impair the efficiency of the roadbed in the interests of the safety of the travelling public and trainmen.

The rules and regulations, after several minor amendments, have been thoroughly tested, and have apparently worked with equity to all whose cases have come before the Board for adjustment.

In closing my year of service in your cause, I desire to express my appreciation of the cordial assistance rendered by my colleagues on the Council and by your indefatigable Secretary. To this combined force I attribute whatever success in advancing your interests has fallen to the year of my administration.

Wednesday, January 26th

Wednesday, January 26th, was devoted to visiting various important industries and places of interest, under the guidance of members of the Ottawa branch. At 10 a.m. and 2 p.m. excursions conducted by Messrs. McRae, St. Laurent, Bruce and Stewart left the Russell House for the Chaudiere Dam, Parliament Buildings, Archives, Royal Mint and Dominion Observatory.

At the same hours parties under the direction of Messrs. Dion, Donaldson, Keefer and Ker made a trip to the power house of the Ottawa Electric Company, Mr. J. R. Booth's mills, the E. B. Eddy Manufacturing Company's plant and the city waterworks. These expeditions proved to be of the greatest interest to the visitors. Naturally the keenest interest was taken in the Chaudiere dam, the power house and the city waterworks, but the industrial plants were by no means overlooked. Indeed, the name of J. R. Booth, the "wonderful old gentleman" who personally conducted the visitors around his mills and explained with characteristic ability the operation of the various portions of the plant, was a household, or rather a hotel expression for the rest of the day.

The annual banquet of the Society was held in the Russell House, Ottawa, on Wednesday evening, January 26th. It was generally conceded that this function was one of the most successful of the kind in the history of the Society. Over two hundred members and guests were present. Among the latter were the Hon. G. P. Graham, Minister of Railways and Canals; Hon. William Pugsley, Minister of Public Works; Hon. Clifford Sifton, Chairman of the Conservation Commission; Dr. W. F. King, Chief of the Boundary Survey; Professor McLean, of the Railway Commission; Senator Edwards, Professor Adam Shortt, Controller Champagne, Mayor Hopewell and Mr. R. E. Young. Following the customary toasts to the King and Governor-General, Mr. W. F. Tye, Montreal, proposed "Canada and the Empire." Senator Edwards responded and paid a gratifying tribute to the work of the engineering profession in Canada. A similar compliment was paid by the Hon. Dr. Pugsley, who replied to the toast, "Our Guests." Dr. Pugsley bore testimony to the good work done by engineers. "It would be impossible," he said, "for a department to be served more faithfully than the Public Works are now being served by their engineers." Canada, he thought, was on the eve of exceptional development. Dr. Pugsley made some interesting remarks in connection with the question of transportation and that of the development of the water powers. The speaker dealt at some length with the progress in Western Canada and stated that a scheme was in formation to create a system of waterways which would connect Winnipeg with the sources of the Saskatchewan river at the Rocky Mountains, a distance of 1,500 miles. With reference to the proposed Canadian navy, a topic very much in the public mind just now, Dr. Pugsley stated that the Government's policy is in favor of the project. Whether this is wise or not is a question which will have to be answered by the people of the Dominion.

Hon. G. P. Graham, Minister of Railways, made a humorous address which was particularly well received. The speaker dealt at some length with the resignation of Mr. M. J. Butler. Mr. Graham declared that public works engineers were a philanthropic set of men working in the best interests of the country. The only reason he could assign for Mr. Butler's resignation was that Mr. Butler had come to the conclusion that he could serve his country better in another sphere. The speaker eulogized Mr. Butler as an engineer without a superior on the continent. "Mr. Butler knows a great deal," said Mr. Graham, "in fact, at times I have thought that he knew too much." The speaker commented upon the exclusiveness of the engineering profession and referred to the fact that not one of the delegates had applied for Mr. Butler's post. "It would have been all the same if you had applied," said Mr. Graham, "you would not have got it." The responsibility of the engineer was emphasized by Mr. Graham, who cited the Quebec bridge disaster as an outstanding example. Speaking of the development of Canada's resources, he said that any government which committed the folly of being niggardly at this stage of the country's development would be recreant to its trust.

Hon. Clifford Sifton delivered a forcible address and requested the Canadian Society of Civil Engineers to appoint a committee to act in conjunction with the Conservation Committee in the matter of giving advice.

Prof. Adam Shortt defended civil service examinations, and stated that Canada's best natural resources were men who should receive and be required to have as broad an education as possible.

Mr. C. F. Baker, of New York, representing the "Engineering News," who replied to the Press, anticipated the day when all tariff barriers between Canada and the United States would be swept away.

The toast to the retiring president and council was proposed by Colonel Ruttan. President Mountain, in response, testified to the pleasure he had obtained in the fulfilment of his duties during the past year. The work of the council was especially to be commended. The retiring president stated that under the constitution, as a past president, he would remain on the council for a period of three years. After this he would join the rank and file of the Society and still continue to have its work at heart.

Report of Sub-Committee on Rails, Fastenings and Tie Plates

In the report of your Sub-Committee on Rails, Fastenings and Tie-Plates, at the last Annual Meeting, consideration was given to a comparison of the various standard and proposed sections in use by the railways of North America.

It was hoped that, during the year, sufficient information would have been obtained from the reports of the various railways to enable the Sub-Committee to present at least a study of the comparative results from the use of the various sections, but it has been impossible to do so up to this time.

Naturally, there was much diversity of opinion among the users of rails with respect to the typical sections which might promise the best results, and there was some hesitancy upon the part of the majority of railways to abandon their past standards and experiment with any of the proposed types.

Some of the railways, however, have made use of new types. The Canadian Pacific Railway have a new section embodying features of both the sections "A" and "B" proposed by the American Railway Association; and some of the railways in the United States have made experimental rollings with both sections "A" and "B," drawings of which were shown in the last report of your Committee.

One difficulty in making a comparison of the tests of the different sections was apparent at the start, and consisted in the variety of designs for the different drop testing machines in use at the various mills.

To overcome this variation of conditions, some of the mills voluntarily offered to construct a machine upon uniform and scientific principles, with the result that most of the mills have now installed such a machine, from which the tests made at one mill become comparable with those made at any other mill.

The description or specification and a drawing of this machine accompany this report.

It has been found, from a series of tests with the new machine, that the deflections obtained upon the test rails at different heights of drop are greater and more uniform than the deflections obtained upon the old machine under the same conditions, and, therefore, give more accurate information upon which to base a study of the properties of the rails.

It is the opinion of your Sub-Committee, therefore, that new specifications for rails should contain a requirement for the Standard Drop Testing Machine.

It is to be hoped that within the next year the records of use of the various new sections will have been sufficiently advanced and tabulated to enable an opinion to be formed as to the results of the [illegible]

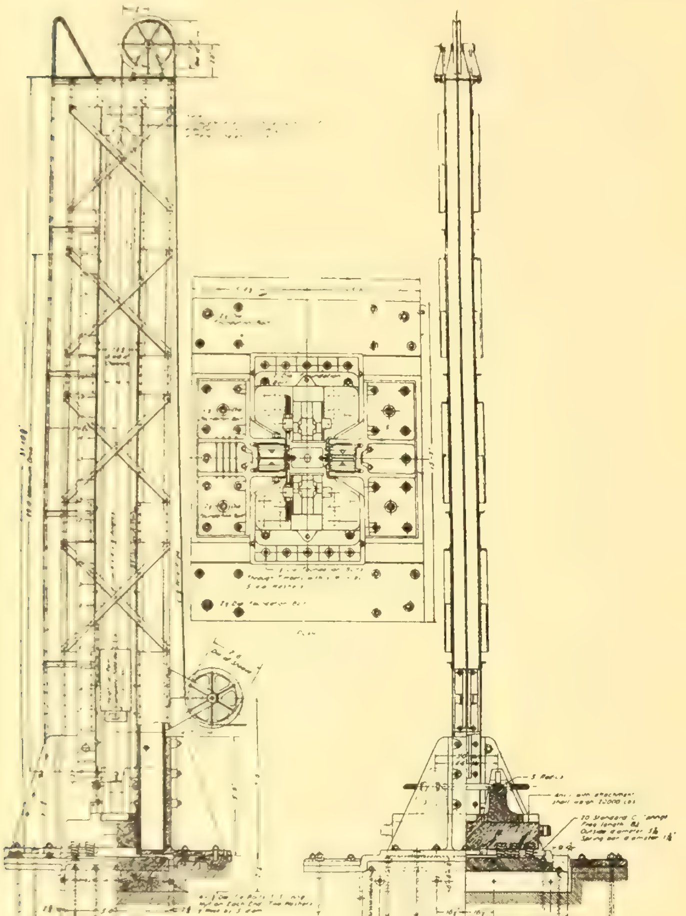
Description of Drop Testing Machine

1. The machine shall be designed to allow a [illegible] tup to fall freely at least 25 ft. on the centre of a rail resting on sup-

[illegible] that can be adjusted to spans varying from 3 ft. to 4 ft. 6 in.

The anvil shall be a solid casting, weighing, with the attachments that move with it, 20,000 lbs. It shall be free to move vertically independently of the lead columns, and shall be supported on twenty (20) springs known as the standard "C" spring, without centre coil, as employed by the Master Car Builders' Association (their figure 5611). This spring has a free length of 8 1-4 in., an outside diameter of 5 7-16 in., and is made from a bar having a diameter of 1 3-16 in. These springs are to be arranged in groups of five at each corner of the anvil, and are to be held in place by hubs raised on the top of the base-plate, and by circular pockets on the underside of the anvil. Removable finished steel wearing strips shall be secured to the anvil and the lead supports for guiding the vertical movement of the anvil.

3. The base-plate shall be of cast iron or cast steel, eight (8) inches thick in the area covered by the anvil. It shall be firmly secured to the substructure by four bolts, two (2) inches in diameter.


Half End Elevation
Half Section through Centre
Half Side Elevation
Half Section through Centre

Standard Drop Testing Machine.

4. The substructure shall consist of a timber grillage, resting on a masonry foundation. The grillage shall project nine (9) inches beyond the ends of the base-plate, and clear the columns at the side. It shall consist of one course of 12 in. x 12 in. sound oak or southern yellow pine, preferably creosoted, laid close and well bolted together. The masonry, preferably concrete, shall be not less than five (5) feet deep below the grillage, and be suitably supported on the sub-soil.

5. The pedestals for supporting the test rail shall be substantial castings. The rail supports shall be removable pieces of steel, securely held in the pedestals, having an upper cylindrical surface, with a radius of five (5) inches. The pedestals shall be adjustable to spans varying from 3 ft. minimum to 4 ft. 6 in. maximum between centres. They shall be securely held together, and so fixed to the anvil as to insure that the centre of span shall always coincide with the centre between leads.

6. The leads shall be firmly connected to the base-plate, and well braced. They shall be long enough to provide the prescribed free fall of the tup. They shall be provided with a convenient ladder and a plainly marked gauge, divided into one-foot intervals. The zero of this gauge shall be 5 1-4 in. above the top of the rail supports, and the specified height of drop shall be measured from this zero, irrespective of the height of rail being tested. One of the guides shall have a removable section, six (6) feet long at the bottom, so that the tup or tripping block can be readily removed.

7. The tup shall weigh, with the accessories that drop with it, 2,000 lbs. The striking die shall be steel, having a cylindrical striking face, with radius of five (5) inches, and a length of twelve (12) inches. The guide grooves shall have finished surfaces. The tripping head shall alow a grip of the tongs that will release at the exact height for which the tripping device is set, and that will be safe from accidental release while the test is being shifted.

8. The tongs and tripping device shall be arranged to release the tup automatically only; no manual releasing will be allowed. The tripping device shall be easily adjustable at one-foot intervals.

Thursday, January 27th

The business session of the convention, which had been adjourned since Tuesday, was re-opened on Thursday morning for the reception of the scrutineers' reports and other work.

In connection with the work of the committee on cement, it was decided, after an interesting discussion, that the investigation of the qualities of sand and their effects on concrete should be left for separate consideration by a special committee appointed for the purpose, and that arrangements should be made with McGill University whereby experiments along this line might be carried out. The report of the committee on "Standard Methods of Testing and Specifications for Portland Cement" was adopted with this provision.

As an outcome of Hon. Clifford Sifton's able speech at the banquet, it was moved and unanimously adopted at this session that the council of the Society appoint members in each province to look into the matter of the conservation of natural resources of lands, forests, mines and waters, with a view to giving every aid to the Conservation Commission.

Announcement is made that the Ottawa staff of this commission is now busily engaged in getting together all the information as regards the recent meeting in the capital. When this has been done it will be printed as Bulletin No. 1 of the department. At present only a small staff is engaged locally, but this will have to be enlarged by the appointment of specialists in charge of mines, water powers, forests, and so on. The regular work of the commission also includes the gathering of much information as to conservation from outside sources.

The matter of a more complete organization of the engineering corps of the Dominion was brought before the meeting as an outcome of the address of Mr. Dodwell, of Halifax, on Tuesday. The question was referred to a special committee, of which Mr. H. Holgate, of Montreal, was appointed chairman, with instructions to memorialize the Government through the council of the Society.

Representatives were named as members of the proposed Canadian National Committee of the International Electro-Technical Commission, this committee also to include representatives of electrical companies and of the physical departments of the universities.

The election of officers, which marked the closing of the session, resulted as follows: President, Col. H. N. Ruttan, Winnipeg; vice-presidents, Messrs. W. F. Tye, Montreal; C. H. Rust, Toronto, and R. W. Leonard, St. Catharines. Council: Messrs. C. R. Coutlee, Phelps Johnson, H. J. Cambie, D. MacPherson, A. E. Doucet, L. A. Herdt, J. A. Bell, C. E. W. Dodwell, C. N. Monsarrat, J. G. Sullivan, A. W. Campbell, J. M. R. Fairbairn, J. M. Shanly, H H. Vaughan, W. J. Francis, J. E.

Hardman, H. E. Haultain, H. G. Kelley, R. J. Durley and R. S. Kelsch.

The newly elected council held a meeting in the afternoon for the transaction of routine business and the appointment of special committees. This brought the convention to a close.

A Brief Definition of the Can. Soc. C.E.

The Society was incorporated by and holds its charter from the Dominion Parliament under date June 23, 1887. It was modelled after the Institution of Civil Engineers (Great Britain) and comprises engineers of all branches of the profession. Among the original incorporators were Mr. Thos. C. Keefer, Ottawa; Mr. Casimir S. Gzowski, Toronto; Mr. John Kennedy, Montreal; Dr. H. T. Bovey, Montreal, (late Dean of the Faculty of Applied Science); Mr. H. D. Lumsden, late Chief Engineer of the National Transcontinental Railway; Mr. H. N. Ruttan, Winnipeg, and Mr. Collingwood Schrieber, late Deputy Minister and Chief Engineer of Railways. The Society is governed by a council consisting of a president, three vice-presidents, twenty councillors, treasurer and secretary. Its annual meeting is held in the month of January at any convenient point. Of late years the practice has been in favor of holding the annual meeting at the home city of the retiring president.

The business meetings of the Society are held monthly. Meetings for the discussion of professional affairs are held in four sections, namely—general, mechanical, electrical and mining, designating the classification of the engineering subjects considered by the respective branches. Each of the sections has a chairman and vice-chairman, who are held responsible for the selection of papers read and discussed under their direction.

The object of the Society is defined in the charter as "to promote the acquisition of that species of knowledge which has special reference to the profession of engineering and to encourage investigation in connection with all branches and departments of knowledge connected with the profession." In pursuance of these objects, the Society, in addition to conducting papers, etc., has committees at work engaged in investigation along the several lines of engineering. The committees reporting at the annual meeting, detailed above, dealt with cement manufacture and specifications, questions relating to transportation, such as transportation routes, ties, road bed, etc., and other important matters.

A committee is at work on the question of establishing a government testing laboratory. From time to time the committee makes recommendation to the Government in regard to matters affecting the engineering profession. The headquarters of the Society are at 413 Dorchester street west, Montreal. Here there is an up-to-date technical library, which is not only available to resident, but also to non-resident members. Branches of the Society are established in Vancouver, Winnipeg, Toronto, Ottawa and Quebec. The membership at the last annual meeting was 2,626. The rate of increase during recent years has been about 300 per annum.

A Word About the Ottawa Branch

The Ottawa branch, upon whose shoulders fell a large share of the burden of the recent convention, is quite a youngster, having only been organized on January 18th, 1909. The prominent engineers of the federal capital are enthusiastic in the work of the Society. In the Ottawa branch there are now 51 members, 58 associate members, 55 students, and 14 associates. The officers for the current year are: Chairman, Mr. W. J. Stewart; managing committee, Messrs. A. Bruce, A. A. Dion, A. T. Phillips, M. Donaldson and N. N. Couchan. The secretary-treasurer is Mr. S. J. Chapleau. Mr. Coutlee, who is one of the most popular members of the Society and who has just been appointed to the council of the main body, was the first chairman of the Ottawa branch and was largely responsible for its inauguration. That the 24th annual convention passed off so successfully and that the smile of contentment was so much in evidence among the visiting members, was due largely to the painstaking work and the careful provisions of the special reception committees appointed by the Ottawa branch.

Contractor Walberg Wins Appeal Case

The long drawn out case of Walberg vs. the King in connection with settlement of the account of work done by Walberg in connection with the new car shops at Moncton for the Intercolonial Railway has been finally settled. Mr. Walberg's contract has been up several times before the Public Accounts Committee, where the Opposition endeavored to prove that there had been an overcharge in connection with the work. By the decision handed out last week Mr. Walberg will be allowed a considerably larger sum than was allowed him at first by the Registrar of the Court.

Mr. Justice Cassels finds that the amount due Mr. Walberg is in round numbers about $90,000, whereas the sum fixed on by Mr. Audette as compensation for the contractor was $53,000.

The case rose out of certain work done by Mr. Walberg in connection with the water and sewerage system for the Moncton shops. Although no written contract was let for such work it was done under the instruction of the Chief Engineer and was supervised by the railway officials. The contractor claimed $105,940, and brought a claim in the Exchequer Court for that amount.

The Registrar of the Court, Mr. Audette, held that the value should be estimated upon the basis of work other than directed by the Chief Engineer, and fixed the round sum due at $53,000. Walberg appealed from this report, claiming that under the reference he was entitled to the full value of the work executed by him.

Justice Cassels holds that this claim was well founded and accepts the prices fixed by the Government Engineer, which in round numbers amounts to $90,000. Mr. Walberg gets the cost of this appeal.

New Pressed Brick Company

The organization of the Canadian Pressed Brick Company, Limited, of Hamilton, is announced. A charter was recently secured for its incorporation from the Ontario government. The capital is $10,000, and the officers are as follows: A. M. Lewis, president; John H. Williams, vice-president; J. H. Salter, secretary-treasurer. The company's property is located on the line of the T. H. & B. Railway, east of Hamilton, and will have splendid shipping facilities to all points. The plant is now under construction, and is being rapidly completed with a view to starting the manufacture of pressed bricks about the middle of February. Kilns of the most approved type and the latest modern machinery are being installed. The plant will be under the practical supervision of Mr. David New, who has had wide experience in making pressed brick and other clay products. They will start with a capacity of about twenty thousand bricks daily, and it is the intention to build additional kilns very shortly and double the output. The officials of the company state that no pains will be spared to turn out a high class product.

We regret to record the death of Mr. C. Lynott, a prominent contractor of Hull, Que.

Two Recent Highway Bridge Problems

The Scarlett and Bradford Bridges, Near Toronto—Showing How the Nature of Foundations Affects Design and Cost

By Frank Barber*

The Scarlett Bridge spans the Humber river about a mile south of Weston, Ont. The river is 200 feet wide at this point and the bottom is shale rock. In the lay out of the bridge the question arose as to which would be more economical and otherwise advisable, a single span bridge or two spans with a centre pier. As to the available materials for the substructure, suitable gravel for concrete could not be obtained near the bridge site, so that concrete would be somewhat more expensive than in most situations, and abutments faced with Longford limestone and backed by riverstone, would cost little more than concrete and would better resist the abrasion of ice. However, a centre pier faced on all sides with limestone would be considerably more expensive than concrete, and for the sake of appearance, abutments and pier must be of the same material. Thus economy demanded that if a centre pier were used the whole substructure should be of concrete, but if two abutments alone were required limestone would be used.

An estimate was prepared by the engineers indicating that the cost would be about the same for either plan. It was considered that the accidents of bidding might throw the balance of favor either way, so that bids were called for according to both plans, with the result that the preliminary estimates were confirmed. The estimates follow:

Single Span.

Steel truss bridge 203 feet, c. to c. of bearings, including concrete floor	$10,700
Two limestone abutments	4,450
Filling approaches	300
Temporary bridge and removal of old bridge	250
	$15,700

Double Span.

Two steel truss spans, including concrete floor	$8,300
Concrete abutments and centre pier	6,750
Filling approaches	300
Temporary bridge and removal of old bridge	250
	$15,600

The cost being practically the same for either method, the single span was adopted for the following reasons: Because of the undermining effect of freshets on piers and the abrasion of ice, it was considered that a pier, especially in the middle of a river, should be avoided when possible. Secondly, the improved waterway, if no centre pier was used, might be required during a possible exceptionally severe flood. Thirdly, the much heavier steel structure required for a single span would be more permanent than lighter structures on account of the greater thickness of metal.

The diagram shows the form of truss adopted, the fourteen panelled Baltimore truss, with the principal measurements. The top chord members and end posts had faced ends and the holes for field rivets were sub-punched and afterwards reamed true while the parts were temporarily assembled at the shops. The parts consequently fitted perfectly in the field and drifting to enlarge unfair holes had never to be resorted to. The rivets were driven by air.

The contractors for the superstructure were the Ontario Bridge Company, of Toronto, and for the substructure O. L. Hicks & Son, of Humber Bay. The reinforcing for the floor was "No. 1 Heavy" expanded metal, manufactured by the Expanded Metal & Fireproofing Company of Toronto. The mill and shop inspection was handled by the Canadian Inspection Company. The county commissioners were: Warden Geo. S. Henry, W. D. Annis and J. E. Harris.

The bridge was opened for traffic in November. It is at present the longest single span highway bridge with a concrete floor in the province.

Scarlett Bridge, Near Weston, Ont.

Bradford Bridge.

Bradford bridge, half a mile from Bradford, Simcoe County, connects the Counties of York and Peel across the Holland River. The width of the river is 200 feet. It is sluggish and deep (14 feet) and never rises above the level of Lake Simcoe. The nature of the banks and bed is such as to present an interesting problem to the bridge engineer. On the York side hardpan lies nearly seventy feet below the surface of the river and on the Simcoe side 45 feet, and the intervening soil is much too soft to give proper lateral support to piles. On account of the very soft soil, spliced piles were looked upon with disfavor. With some trouble very heavy Norway pine piles, about 70 feet long, were procured from Northern Ontario. The pile driver was erected on a raft in the river and operated by a steam hoisting engine. All piles were driven to refusal. The plan of the abutments and wing walls is nearly square. After the piles were driven and capped the inside of the square was first filled with stone and afterwards the outside to the surface of the water. The stone was allowed to settle for a month, when more was added. After this practically no settlement occurred. Upon these foundations the concrete was built.

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* Of Barber & Young, Bridge and Structural Engineers, Toronto

As to whether a single span bridge or a double span with centre pier should be adopted, the following considerations decided in favor of the latter. The double span was somewhat cheaper. Here a centre pier including piling could be built for about $500 less than one for the Scarlett bridge on account of the much smaller distance from water to bridge floor. The river at this point is nearly dead water, so that no harm to a centre pier was anticipated from undermining or ice. Moreover a concrete and paving brick floor, weighing 120 lbs. per square foot, could be adopted on a double span bridge without heavy first cost, but a concrete floor, weighing 75 lbs. per square foot, would have to be used for the single span, and a brick floor was considered most desirable for this bridge. The difference in dead load between the two kinds of floor would only slightly affect the weight of steel required in a two span bridge but would have a considerable effect upon a long single span.

Bridge near Bradford, Ont., over the Holland River

The bridge was completed in April, 1909. The contractors for the substructure were Barret & Scott, and for the superstructure the Dickson Bridge Works Company. The commissioners for Peel County were T. J. Simpson, A. E. Scanlon and W. Woods, and for York County, Wm. Keith, A. E. Pugsley and Isaac Devins. The total cost was $18,000.

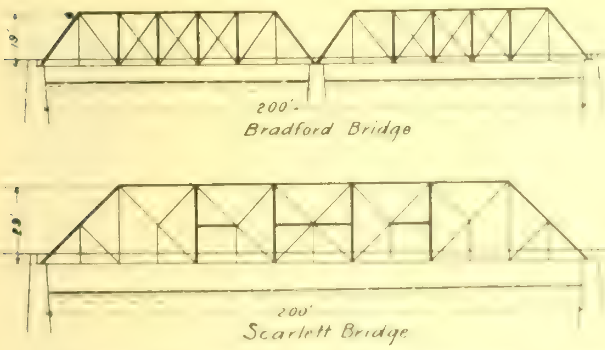


Diagram Showing Forms and Dimensions of Trusses

The engineers for both bridges were Barber & Young of Toronto.

Building Inspector Jarrett, of Vancouver, has requested the City Council to appoint a committee of practical builders to make draft amendments to the building by-law.

Mr. Mathew Joseph Butler

M. Can. Soc. C. E.

Mr. Matthew Joseph Butler, who recently resigned his position as Deputy Minister and Chief Engineer of the Department of Railways and Canals in order to become general manager of the Dominion Iron & Steel, and Dominion Coal Companies, was born at Deseronto, Ont., in 1856, and is the son of Irish parents.

Educated first of all at a public school, he afterwards proceeded to the De La Salle Institute, then to the Toronto University, and, eventually to the Kent College of Law, where, in 1897, he graduated LL.B.

For three years he served as an apprentice to engineering and surveying with Messrs. Evans & Bolger, of Belleville, Ontario. He was admitted Ontario Land Surveyor in 1878, and the following year was admitted a Dominion land surveyor.

Mr. Butler practised as a surveyor from 1878 to 1883, in which year he took up the position of transit man on location survey on the Kingston & Pembroke Railway. During the year 1884 he was engaged upon the construction of the Thousand Islands Railway, of which system, in 1885, he became chief engineer.

Mr. M. J. Butler, the retiring Deputy Minister and Chief Engineer of Railways and Canals

Mr. Butler's next appointment was that of chief engineer of the Napanee, Tamworth & Quebec Railway. From 1886 to 1887 he was engineer of the buildings and water service of the Atchison, Topeka & Santa Fe Railway. For a couple of years following 1888 he was in Quebec, where he built a ground wood pulp mill and operated the same as a partner.

From 1890 to 1896 he was chief engineer of the Bay of Quinte Railway, Thousand Islands Railway, Oshana Railway, and various other industrial enterprises, owned and controlled by the Rathbun Company, including lumber manufacture, brick and terra cotta and Portland cement. During 1896-7 Mr. Butler was attending the law school in Chicago. At the end of the course he graduated and was admitted to the bar of Illinois.

Returning to Canada in July, 1897, he resumed engineering practice, and engaged in general consulting work, being retained as consulting engineer in Canada for the Engineering Contract Company of New York

By the city of Brantford his services were requisitioned in connection with a scheme for preventing floods, and eventually, after carrying out a number of important works in various parts of the country, he became chief engineer for Mr. M. J. Haney, contractor for the Hillsborough bridge, Charlottetown. This was a work of considerable importance, involving the use of five pneumatic caissons, sunk 97 1-2 feet below the tide. Difficult as the undertaking was, however, it was carried to completion without a hitch.

In 1903 Mr. Butler became chief engineer to the Locomotive & Machine Company of Montreal. For this concern he prepared the plans, organized the forces, and supervised the construction of the works. When the works were finished Mr. Butler was responsible for the erection of the structural steel plant, which has since turned out a large quantity of structural steel work for bridges and other buildings.

The Dominion Government first acquired his services in 1905, when, as assistant chief engineer, he was engaged in organising the work and preparing the specifications for the construction of the National Trans-Continental Railway. In the autumn of the same year he was appointed to the office which he has just resigned.

Among the more recent undertakings that have claimed his attention, mention may be made of the management of the Government system of railways; the construction of the Trent canal system, and the surveys of the proposed Hudson Bay Railway. The reconstruction of the ill-fated Quebec bridge has also been entrusted to the Department of Railways and Canals.

Mr. Butler is a member of the Canadian and American Societies of Civil Engineers, and of the British Institute of Civil Engineers.

Montreal Builders are Well Organized

The History, Personnel and Work of their Exchange—What the Association has Accomplished in Recent Years

The record of the Montreal Builders' Exchange since its inauguration a little more than twelve years ago, is one of which any association would be justly proud. Time and again the Exchange has proven its value to the building and contracting trade in Montreal. To their judicious handling of labor matters must be credited largely the fact that building construction in this city has been practically free from strikes, while other Canadian centres have met with a heavy share of industrial trouble.

Through the efforts of the Association, legislation has been enacted from time to time which has been extremely beneficial to the contracting trade. In 1907 an important judgment was obtained in the Superior Court justifying the action of contractors in making trade agreements jointly and severally in self defence when unjustly assailed by a labor combine or "collective demand" for an excessive increase in wage, and the right to enforce a penalty or fine for any breach of such agreement by a fellow contractor.

In 1907 and in 1908 two successful exhibitions, devoted entirely to building material and supplies, the first of their kind in Canada, were held, and did much to stimulate the general public's interest in the building trade.

During the past year the Exchange has moved into new and commodious quarters, occupying the entire top flat in the recently constructed Eastern Townships Bank. In their new premises they have at their disposal 5,000 square feet of floor space, and portions are allotted to members of the Exchange at a reasonable rental.

The chief feature of interest centres around the department of permanent exhibits. On December 9th of last year this exposition was officially opened and the occasion fittingly commemorated. A large number of Canadian supply houses have made creditable exhibits in the Exchange, and practically all the available space for this purpose has been utilized.

The history of the Builders' Exchange dated from 1897, when at a representative gathering of the leading

Mr. J. N. Arcand,
President of the Montreal Builders' Exchange

Mr. T. A. Morrison,
A Member of the Executive

Mr. James Ballantyne,
Vice-President Montreal Builders' Exchange

Mr. Frank Pauze.

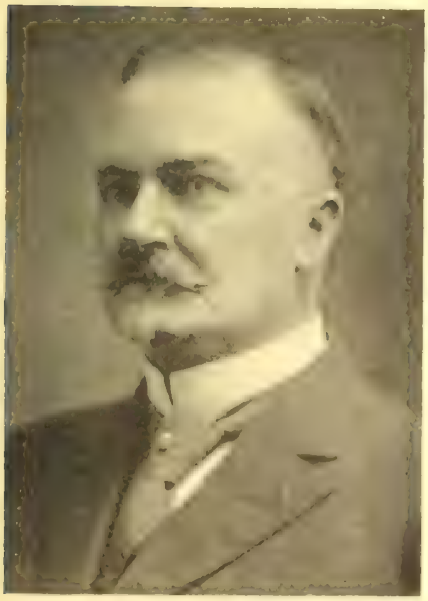
Mr. E. G. M. Cape

Mr. Wm. Rutherford.

Mr. Alex. Bremner.

Mr. J. H. Lauer (Secretary).

Mr. Joseph Brunet.



Mr. W. T. Castle.

Mr. K. D. Church.

Mr. Thos. Gilday.

A PORTION OF THE PROGRESSIVE DIRECTORATE OF THE MONTREAL BUILDERS' EXCHANGE firms in the building industry, the Association was formed. It was not until two years after, however, that a charter of incorporation was sought and obtained from the Quebec Legislature; and it is interesting to know that the charter members, Messrs. Jas. Simpson, C. T. Williams, Peter Lyall, John Maclean, Frank Fournier and Walter P. Scott, are still active members of the organization.

The first president of the Exchange was Mr. James Simpson, who was succeeded, in the order named, by Messrs. C. T. Williams, J. H. Hutchison, N. T. Gagnon and R. George Hood, but for the first few years of its existence the career of the Association was a somewhat chequered one. Starting with a membership of about thirty, it grew to one hundred in the second year, but then gradually fell off until 1905, when the low water mark was reached. It was at this time that the accession to office, of the now past-president, Mr. N. T. Gagnon, and the appointment of a permanent secretary, Mr. J. Herbert Lauer, instilled new life into the organization. To-day the Exchange is the largest in Canada and with the exception of perhaps half a dozen in the United States, the largest on the continent, with a membership of approximately three hundred.

Mr. E. W. Sayer,
A Director of the Montreal Builders' Exchange

On the 12th of January the annual business meeting was held and a satisfactory general report and financial statement was received from the retiring executive. The list of new officers is composed of a number of the most energetic members of the Exchange, and it is a fair inference to suppose that 1910, under their able guidance, will be a banner year in the history of the Exchange.

Mr. Alex. Bremner.—Was one of the charter members of the Montreal Builders' Exchange, and has since been constantly identified with its interests. Has been in the builders' and contractors' supply business in Montreal since 1877, and through his integrity and fair methods of dealing has built up a splendid business. At the close of the present year he undertook the extension of his business by the organization of a joint stock company with a capital of $200,000. One of Montreal's largest property owners.

Mr. Thos. Gilday—Another member of the new executive. Has been a member of Campbell & Gilday, roofers, for the past twenty-five years This firm has been identified with some of the largest roofing contracts in Canada, including the C. P. R. Angus shops, and the works of the Montreal Cotton Company, at Valleyfield, Que. Last year they were incorporated as a joint stock company under the name of Campbell & Gilday Company, Limited.

Mr. J. N. Arcand.—Re-elected to serve a second term as President. Is a representative of the painters' and decorators' section of the exchange. Has been in business in Montreal for twenty-three years, and is widely known throughout Canada. Is a past-president of the Master House Painters' Association of Canada, and of the Master Painters' and Decorators' Association of Montreal.

Mr. Wm. T. Castle.—Senior member of the firm of Castle & Son. Has been a partner in the present firm for twenty-five years. During that period they have established a first class reputation as decorative artists and dealers in antiques of various kinds. In addition to the St. Catherine street west sales room they have a large factory on Mountain street for the manufacture of antique furniture and electric fixtures. Finds time to devote to art and literature, and is now president of St. James Literary Society, and of the St. Antoine Liberal Club.

Mr. James Ballantyne.—Vice-president of the Montreal Exchange, and one of the largest plumbing and steam heating contractors in Canada. His Montreal business was established in 1891 and has grown very extensively since that date. About four years ago he organized the James Ballantyne Company, Limited, with headquarters in Winnipeg, and was himself made president of the company. The record of that business shows it to have been equally as successful as its eastern confrere. Has it to have been equally as successful as the eastern one. Has been an earnest worker in furthering the interests of the Builders' Exchange.

J. Herbert Lauer.—Became associated with the Montreal Builders' Exchange as general secretary in 1905, at a time when the Exchange had reached its lowest ebb. To his earnest efforts much of the success, which the Builders' Exchange has attained to-day, must be attributed. He was indefatigable in promoting the interests of the Association at every turn, and to his efforts must be largely placed the credit of the two successful exhibitions held in 1907 and 1908, and the establishment of the permanent exposition in the Eastern Townships Bank Building.

Mr. J. W. Hughes.—A representative from the plumbers' and steamfitters' section of the Exchange. One of Montreal's older business citizens who has grown up with the city. Perhaps one of the best known residents of the city of Montreal.

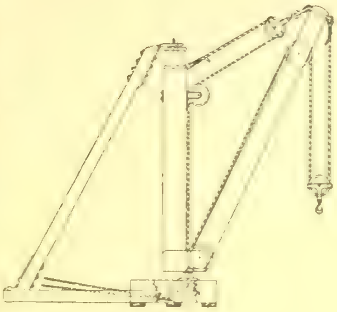
Mr. F. Pauze.—Manager of the old established business of U. Pauze & Sons, contractors and manufacturers. Is a representative of the younger business element, but is very progressive in his methods, and has been notably successful.

Mr. Jos. Brunet.—President and managing director of the Laurentian Granite Company, Limited. Has been eminently successful in business, his company operating one of the largest Canadian granite quarries. Has taken an interest in local municipal affairs. For fifteen years was mayor of the town of Cotes des Neiges, of which place he is a resident.

Mr. K. T. Church—Represents the cement and reinforced concrete interests on the executive of the Builders' Exchange. Was a member of the firm of Swan, Church & Company, and with them achieved splendid success. The new firm of Church, Ross, Limited, was formed a year ago, Mr. Church taking as his partner, Mr. D. W. Ross, a graduate of McGill, and formerly with the Phoenix Bridge Company.

Mr. E. W. Sayer.—Represents the interests of the electrical members of the Exchange. Is one of Montreal's younger business men, and has built up a very successful business. Is the owner and manager of the Sayer Electric Company, electrical supply dealers and contractors, and is president and manager of the King Electrical Works, Limited, manufacturers of fixtures and electrical specialties. Was largely instrumental in the formation of the Electrical Association of the Province of Quebec, of which he is now the president. Finds time to devote to sport, and is an active worker on the executive of the Montreal Amateur Athletic Association.

The annual banquet of the Edmonton Builders' Exchange held recently was attended by over one hundred prominent contractors, architects and others. President C. C. Batson gave an interesting address and sketched the development of the Builders' Exchange during the last five years. In this period the membership increased from 20 to 100. Mr. J. C. Dowsett, president of the Board of Trade, complimented the Builders' Exchange upon their organization and said that he considered the building trade the most important of the commercial and business interests of the city. The outlook for the coming season is exceptionally bright at Edmonton. Excellent harmony prevails generally, and plenty of work is in sight.



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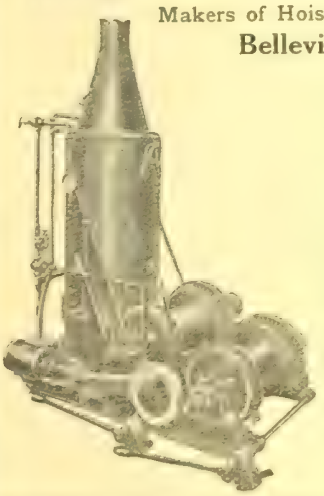

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50	Private Residences	1,023,050	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables,	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and FireHouses	208,664	28,837
656	Total 1st	12.800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
717		17,562,741	

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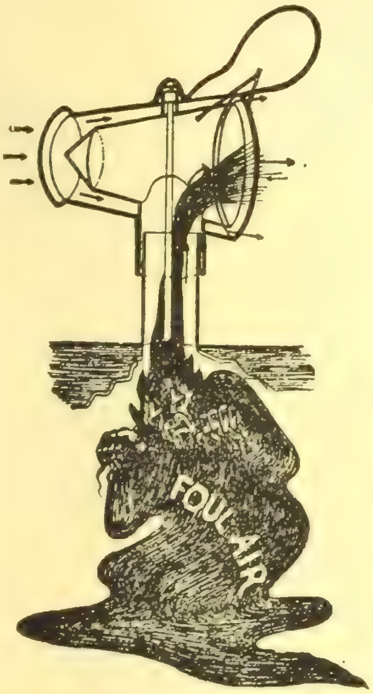

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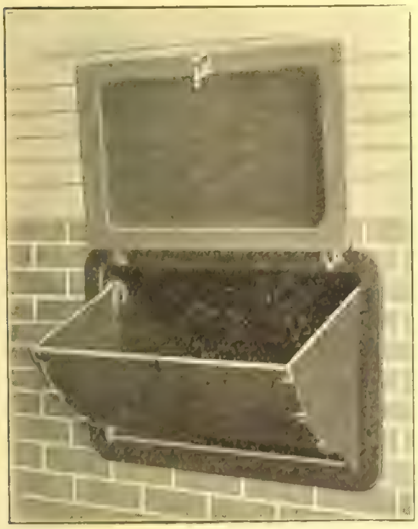

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No modern building is now complete without a fuel chute. It is just as useful in the country as in the city, as it affords the same advantages in both localities.

This illustration shows the chute open and the hopper in position to receive Coal. The door when open locks itself automatically in the position shown, and furnishes protection to the building above the fuel opening, where most of the damage occurs when throwing in fuel in the ordinary way.

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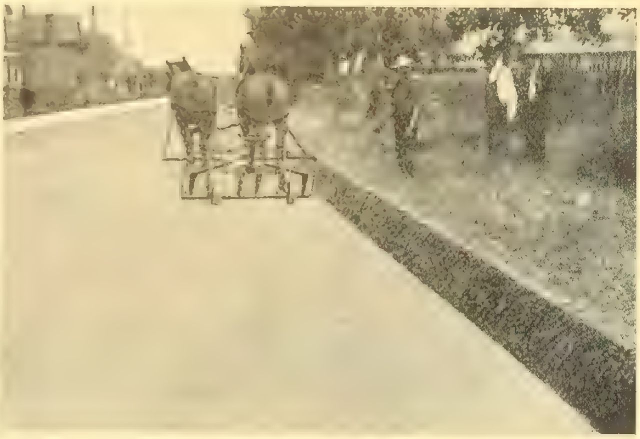

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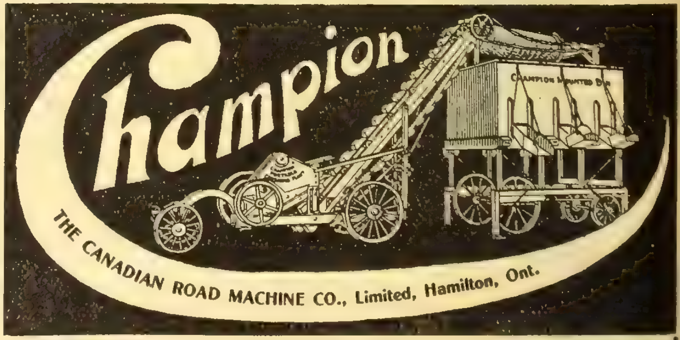

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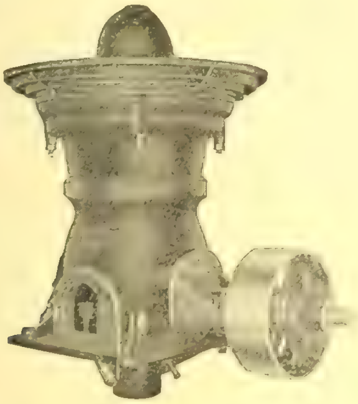

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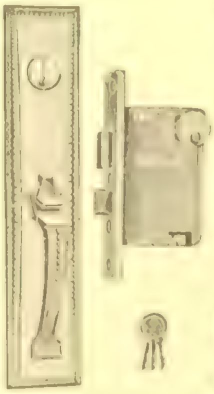

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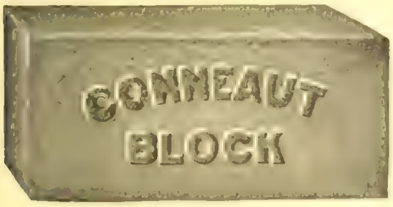

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41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7.25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, any color, ¾-in. square, 1-in. hex. and 3-16-in. round, 35 cents per square foot up.
Floor Tile—½-inch square, 45 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 35 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish, colors, firsts, 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G. cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Brass Goods, Valves, etc.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.
Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.
No. 4 compression bath cock........net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Furnaces, 45 per cent.; registers, 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.; other specials, 40 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00

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Lead pipe, 27½ per cent. off.; lead waste, 27½ per cent. off; caulking lead, 4½ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.	Size.	Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 70; malleable bushings, 67½; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 67½ per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.

7 and 8-inch pipe, 40 per cent.

Light pipe, 60 per cent.; fittings, 70 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots in bags, delivered, Toronto, bags extra, $1.70.

Cement, wholesale lots of 1,000 barrels, f.o.b. Toronto, $1.30.

Crushed stone, $1.25 per ton, f.o.b. Toronto.

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $13.50 to $15 per toise.

Free stone, delivered, $13.50 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.20 to $1.25 per ton.

Scotch fire brick, delivered, $30 to $35 per thousand.

Steel channels and beams, $2.75 per 100 pounds, delivered.

Lime, per cwt., delivered, 38 cents.

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plasters, $5.50 per ton.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $7.50 to $8.00 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.

Pure Green Seal Zinc White, ground in oil, $12.50 to $13.00 per 100 lbs.

Boiled Linseed Oil, in barrels, 78 cents per gallon of 9 lbs.

Raw Linseed Oil, in barrels, 75 cents per gallon of 9 lbs.

Turpentine, in barrels, 80 cents per gallon of 8 4-10 lbs.

Pure Linseed Oil Putty, 25-lb. tins, $3.25 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $2.75 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

E. Desiel, St. Agathe, Que., [illegible] has registered.

The [illegible] Paper Company, Limited, Hartville, N.S., have gone into liquidation.

The B. C. Gazette gives notice of the incorporation of the following companies: B. C. Leather Manufacturers' Agency, Limited, capital [illegible]; [illegible] Manufacturing Company, Limited, incorporated to carry on a building and [illegible] business. [illegible] and Alberta Telephone and Electric Company, Limited, capital [illegible]; B. C. [illegible] Company, Limited, capital [illegible]; [illegible] Company, Limited, capital [illegible]; E. Harris & Company, Limited, incorporated to carry on a general engineering, building and construction business, capital [illegible].

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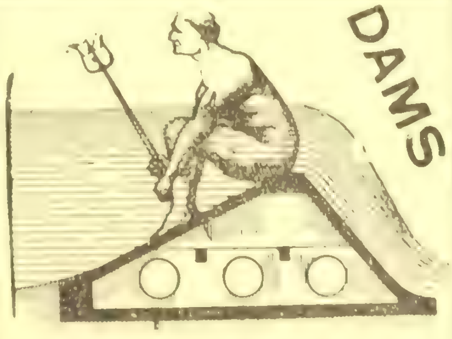

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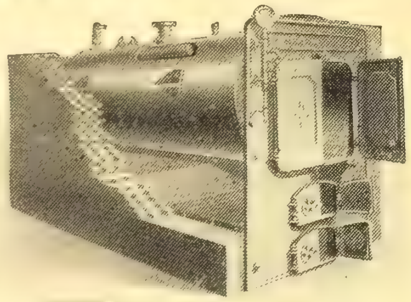

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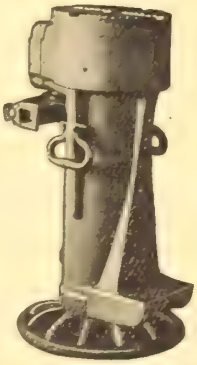

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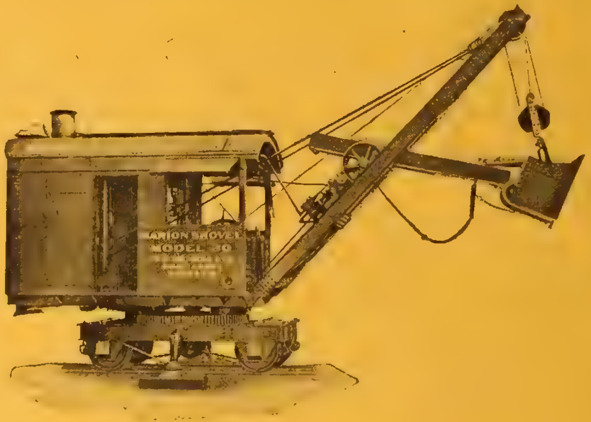

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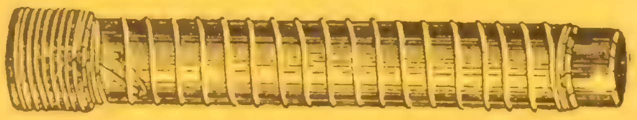

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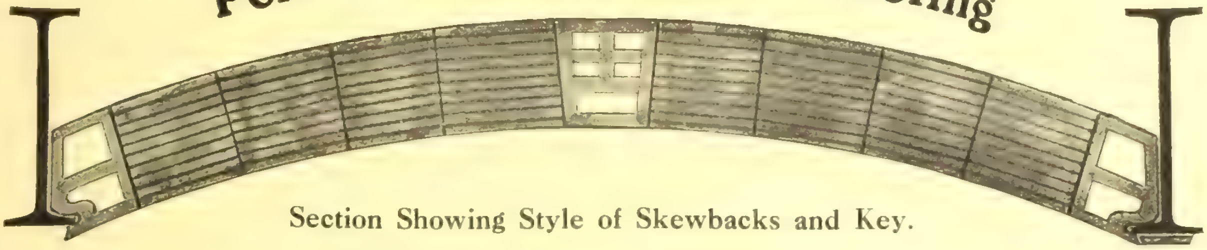

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Limited
Hagersville - Ont.

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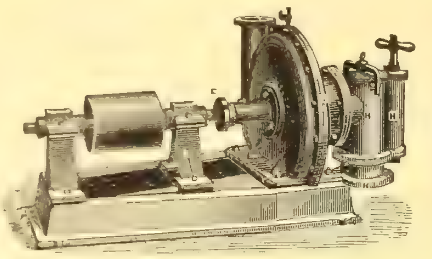
M. Beatty & Sons, Limited **Welland, Ontario, Canada**

Dredges, Ditchers, Derricks, Steam Shovels



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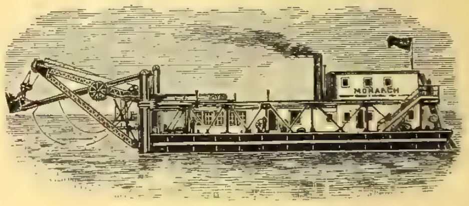
and other Contractors' Machinery.



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Doors Ceilings
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Frames Stairs
Hardwood Flooring
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just let us know and we will ship your orders promptly. Mixed cars a specialty. We also carry Hemlock and Pine (rough or dressed.)

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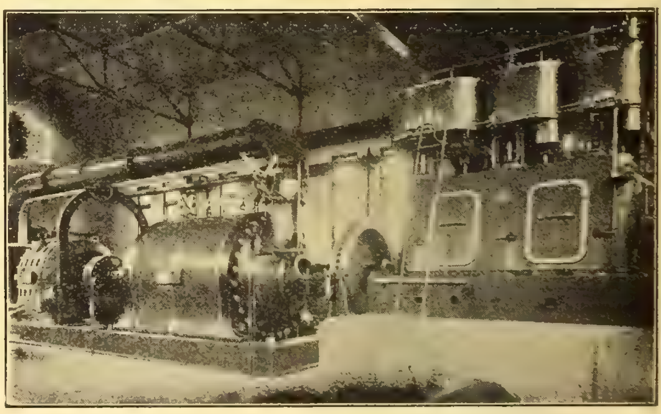

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Water Softening Apparatus,
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DRUMMOND McCALL & CO., Montreal

All Floors in this Building are Reinforced Throughout with

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Victoria Sheds,
Victoria, B.C.

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Petrolea. Ont.

Filtration Plant,
Toronto, Ont.

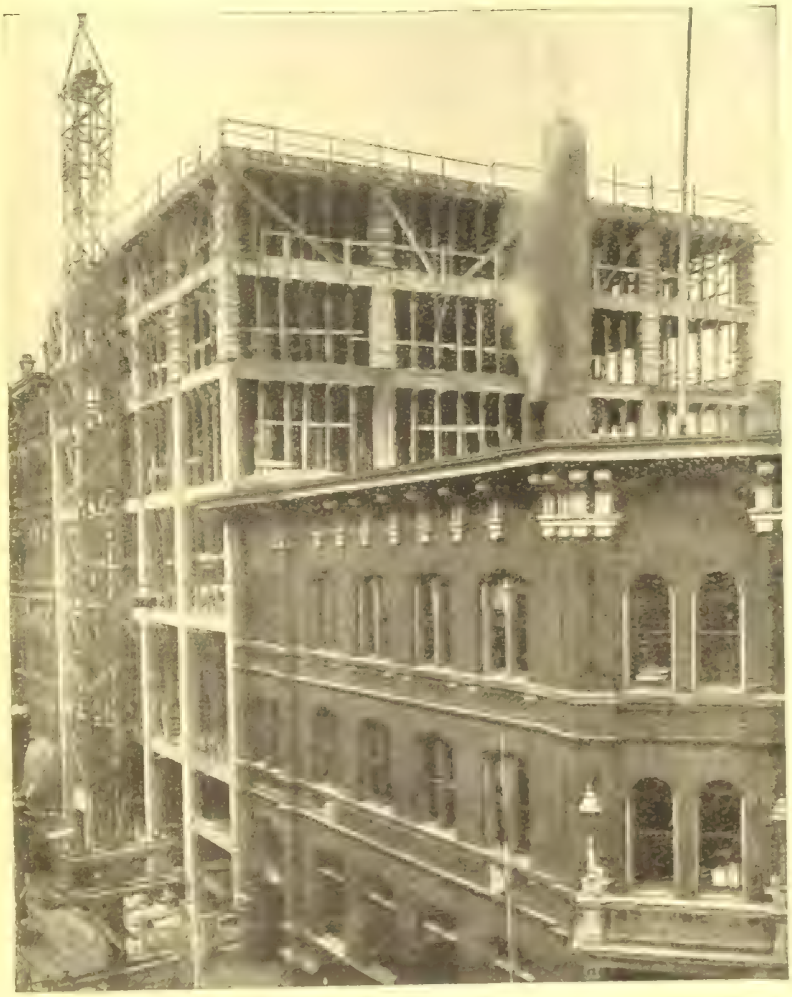
Thomas C. Watkins
Hamilton, Ont.

Halifax P.O.,
Halifax, N.S.

Dominion Exp. Co.,
Ottawa, Ont.

Erindale Power Co.,
West Toronto.

Dominion Concrete
Co., Kemptville, Ont.



Cut shows Reinforced Concrete Building under construction for the Thomas C. Watkins Departmental Store, Hamilton.

Some Users:

Joseph Vincent,
Union, Ont.

Robert Simpson Co.,
Ltd., Toronto.

Murray Shoe Co.,
London, Ont.

Septic Tanks,
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Septic Tanks,
Clinton, Ont.

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This System of Concrete Reinforcement is rapidly becoming known as "The Most Satisfactory and Economical System" on the market. One million square feet of Triangle Mesh sold in Canada during 1909, its first year, attest its popularity among discriminating Architects, Engineers and Contractors. If you are contemplating or have under construction a modern fireproof building it will pay you to investigate "The Beath System.

WE INVITE YOUR ENQUIRY

W. D. Beath & Son, Limited

Toronto - Canada

"I cannot doubt but that the manner in which the defendant has offered its goods to the public, advertised them —the similarity of the labels; similarity of combination in catalogue, the use of the word 'STANDARD,' were fitted to deceive the public, and are proved, in some instances to have deceived the public. Nor can I doubt that such deception was the object kept in view by the defendants' manager." — Extract from Hon. Mr. Justice Archibald's judgment in recent suit of the Standard Sanitary Mfg. Co., Pittsburg, Pa., against the Standard Ideal Co., Port Hope, Ont.

In almost all lines of manufacture there is some recognized leader, some brand that dominates the field because of its proven superiority. In their anxiety to imitate us in every particular, the defendants in the above action have attested that in Porcelain Enamelled Ware "STANDARD" fixtures represent the highest degree of perfection.

Genuine "Standard" Goods are

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Standard Sanitary Mfg. Co.

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Never a Crack, Never a Leak, where Universal Corner Bead is Used

SIMPLEST AND MOST ECONOMICAL TO ERECT and MAINTAIN

3½ CENTS PER LINEAL FOOT, THAT IS THE COST

After you have read the rest of my advertisement I would draw your attention to this fact: Universal Corner Bead has only been on the Canadian Market a very short time, yet it was selected for the following important structures in Montreal City alone, designed by the architects named:—

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David R. Brown
Canadian Express Co. Building
Hutchuson & Wood
Mark Fisher & Sons Building
A. Piche
Linton Apartments
Finley & Spence
Light, Heat & Power Building
Kenneth Rae
Princess Theatre
Finley & Spence
Bennet's Theatre
Warren & Wettmore
Merchant's Bank
E. & W. S. Maxwell
E. Townships Bank
Cox & Amos
And hundreds of others.

If you are one of that great number of contractors and architects, who in the past have pinned their faith to Pedlar Products, I want to say that I unhesitatingly recommend you to use my Universal Corner Bead

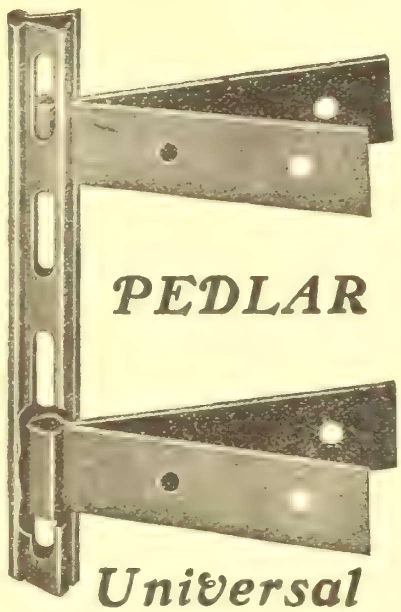
G. H. Pedlar

WE will gladly mail you a further list of names and our

FREE BOOKLET
"FIRE-PROOF" No. 52

Will you write for them?

The names given only represent a few of the lengthy list of users, but they show the kind of indisputable evidence behind Universal Corner Bead.



Universal Corner Bead

Most contractors and architects know from experience that the only way to get a fire-proof and generally indestructible corner or window sill is to use Corner Bead. Wherever wood is used there is always fear of fire or broken corners and the fear is usually fulfilled.

Universal Corner Bead was designed to save window trim and make every outside angle proof against breaks. It can be erected any distance from the wall, and when erected is indestructible. If used on brick corners it will be found adaptable to any depth of ground preparing the corner for, and aiding in the gauging of, the plaster, and doing away with the need of using straight edges or plumb lines.

NO CHANCE FOR RUST

Universal Corner Bead never rusts because it is plated with a special heavy and fine coating of zinc which successfully withstands the action of acids in patent plasters and the carbonic acid of the atmosphere. This electro process, eliminating as it does, the slightest possibility of rust, is in bold contrast to the hot or cold galvanizing process used on some beads, and mostly found ineffective as an anti-rust.

A true key is formed with Universal Corner Bead. Thus plaster and steel are tightly locked together, producing the greatest degree of uniformly-distributed solidarity.

CAN EASILY BE CURVED

When ovals, arches or circles are desired, the "Universal" readily adapts itself in just this way. The side holes are cut at base and the bead bent to fit the desired form. Universal Bead will always be found a true line to guide the plasterer, and any person with a pair of tinner's snips can do the cutting.

THE ADJUSTABLE CLIP SAVES TIME

No need to use pliers or tools when erecting Universal Bead. The adjustable clip makes it possible to secure a quick and easy attachment to the wall. These clips are placed twelve inches apart and the head of each one is made to fill the entire body of the bead in such a way that it can be slid along to any desired spot, thereby meeting the seams between brick and fire-proofing. When spread to the angle of a corner the action of this clip is to bind and lock; therefore it makes for perfect alignment and greatest rigidity.

As to comparative cost of using Corner Bead instead of wood trim around the windows in an ordinary twelve apartment block containing 100 windows: The cost of a cheap wood trim is $400.00 (an exceptionally low estimate). The cost of Universal Corner Bead (using 20 lineal feet for each window) would be $70.00. Leaving at least $330.00 to be spent on luxury or left in the bank.

THE PRICE IS GREATLY IN ITS FAVOR

Universal Corner Bead sells at 3½ cents per lineal foot—cheap enough. Find in this remarkably low price, and the fact that Universal Corner Bead eliminates repair bills, the reason for the ready acceptance of Universal Bead as standard. Do you think for a moment the shrewd architects represented in the budget of names quoted above, and having the interest of his client before him, would have selected Universal Corner Bead for such important undertakings if there had been the shadow of [illegible]?

The PEDLAR PEOPLE of Oshawa

ESTABLISHED 1861

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PORT ARTHUR 45 Cumberland St — WINNIPEG 76 Lombard St — REGINA 1901 Railway St. South — CALGARY [illegible] — VANCOUVER [illegible] — VICTORIA [illegible]
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20

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Phone M. 3056 **TORONTO, ONT.**

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Dimension

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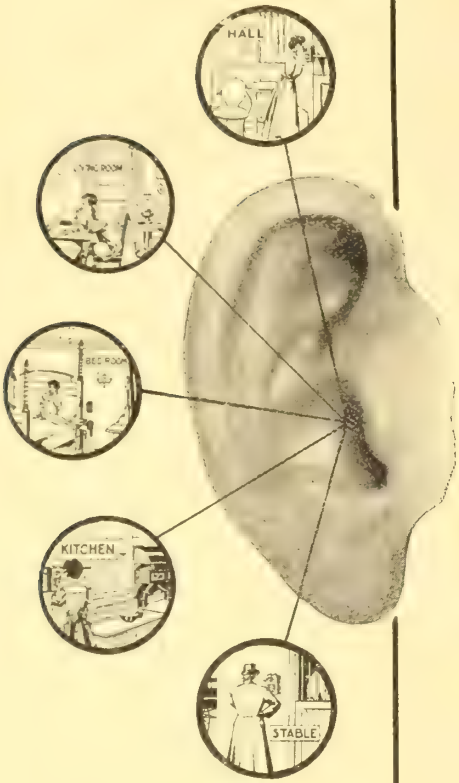
Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.



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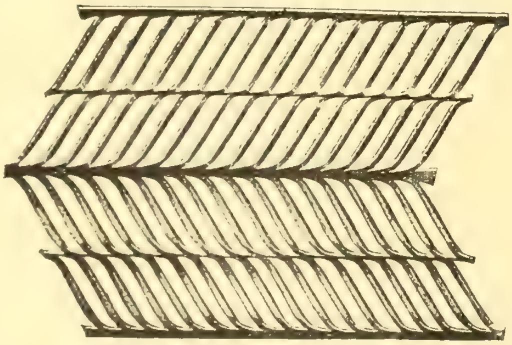

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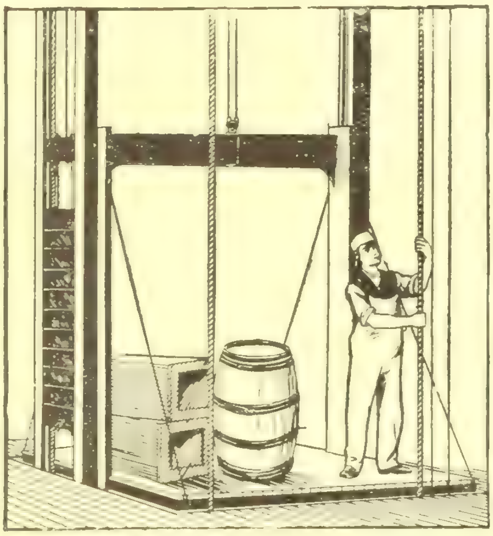

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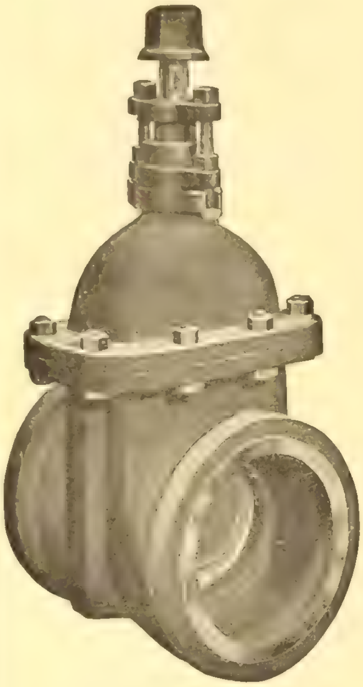

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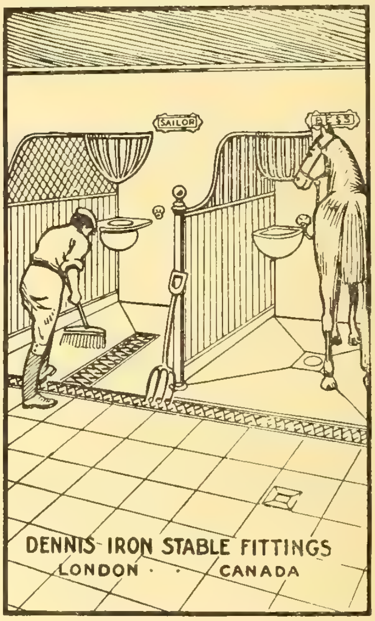

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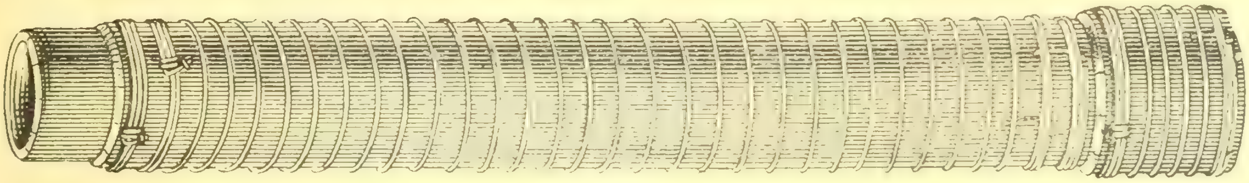

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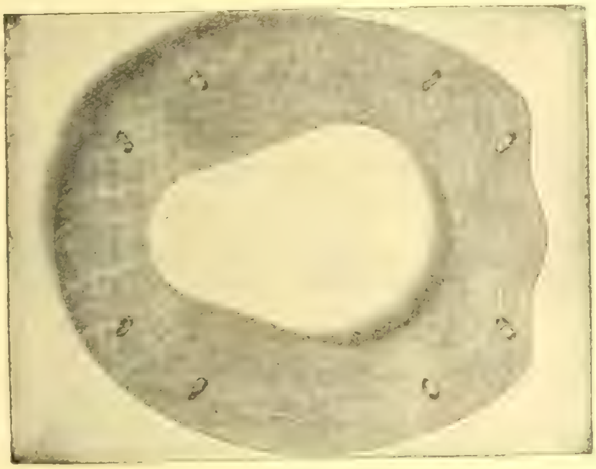

These seats are make in four sections which are tongued and grooved, glued together and held rigid by a heavy bolt at each joint.

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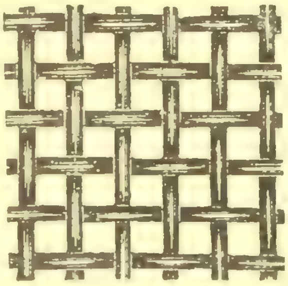

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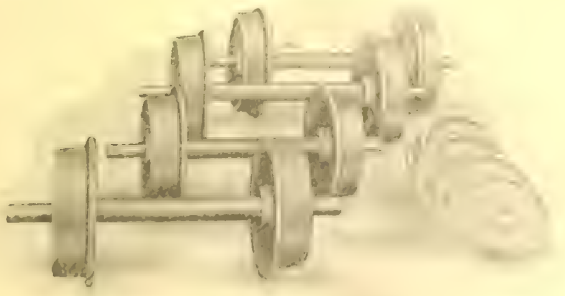

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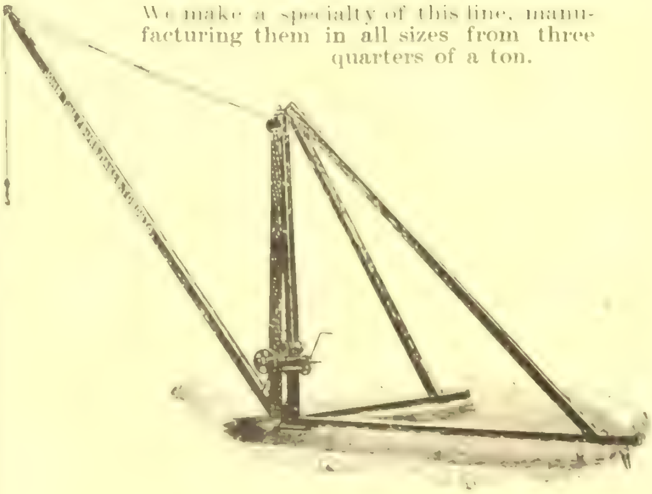

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Hard Wall Plaster

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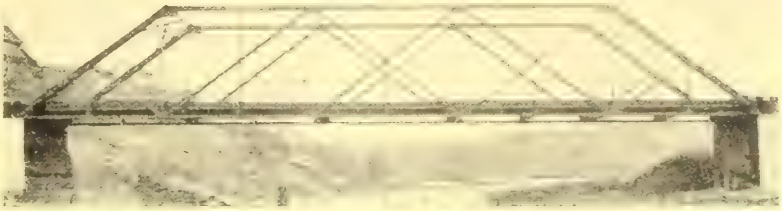

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Calgary, Alta.

Twenty miles of water mains will be laid here this year, the pipe already having been purchased. Water Commissioner Graves favors metering the supply.

Halifax, N.S.

The city council has voted a sum of $20,000 for sewer works in order to give work to the unemployed.

Moose Jaw, Sask.

J. Darlington Whitmore, city engineer, in his annual report urges the construction of a covered reservoir, with a capacity of two million gallons, at an estimated cost of $36,000, which includes the cost of a pump. The construction of another septic tank to cost $25,000 is also recommended, as well as storm sewers estimated to cost $20,000.

Ottawa, Ont.

Plans for a big drainage project in the southwestern part of the city are being prepared by City Engineer Ker. About 200 acres of land now without sewage facilities will be drained. Cost, about $75,000.

Sarnia, Ont.

J. D. Stewart, town clerk, is calling for tenders for waterworks supplies.

Stratford, Ont.

At a meeting of the Board of Works, Engineer Ferguson recommended the calling of tenders for paving a number of the streets.

Toronto, Ont.

At a cost of $52,619 the City Engineer has recommended the construction of an asphalt block pavement in College street, from Manning avenue to the west side of Dovercourt road.

Tenders will be received until Tuesday, February 15th,, for one ten inch water meter. G. R. Geary (Mayor), Chairman, Board of Control. C. H. Rust, City Engineer.

Vancouver, B.C.

In their report on the water supply, Messrs. Hermon & Burwell, consulting engineers, suggest an alternative of a tunnel under or a bridge over the First Narrows for the water mains.

The board decided to call for tenders for the laying of ten miles, more or less, of cement walk. It is possible the work may be divided among several contractors if satisfactory arrangements covering price, etc., can be made.

Winnipeg, Man.

The city are calling for tenders for the supply of asphalt until February 25th. M. Peterson, secretary. For further information see advertisement in this issue.

AWARDED.

Winnipeg, Man.

The contract for city plumbing and sewer connection (list 24) was awarded to G. L. Stephenson for $358.50. T. Ball tendered at $360.25, and another tender was $360.40.

Railroads, Bridges and Wharves

Edmonton, Alta.

It is stated that fifty miles of the railroad by which it is proposed to open up the coal fields of the Yellow Head Pass Coal & Coke Company, west of Edmonton, will be built this year, and the contract awarded within a few weeks. W. O'Brien, of Renfrew, Ont., is interested.

Tenders addressed to John Stocks, Deputy Minister of Public Works, Edmonton, Alta., will be received until March 12th for the manufacture of all steel highway bridges required for the year 1910. Specifications, etc., at the Structural Engineer's office, Department of Public Works, Edmonton.

Fort William, Ont.

The Fort William C. P. R. bridge across the Kaministiquia river will be a lift structure, double deck and will cost approximately $750,000. The construction of it is to be completed on or before October 15, according to the agreement between the city and the C. P. R. The Fort William C. P. R. bridge across the McKellar river will be a lift structure and will cost approximately $300,000. W. P. Merrick, Government engineer. F. W. Peters, assistant to 2nd vice president, C. P. R.

Frederieton, N.B.

The Department of Public Works is calling for tenders until February 28th for the construction of the metal superstructure of the Shediac river mouth bridge, Parish of Shediac, Westmorland County. Plans, etc., at Public Works Department, Fredericton, N.B. J. Morrissy, Chief Commissioner, Fredericton, N.B.

Montreal, Que.

At the G. T. P. offices figures have been given showing that 923 miles of steel are now down on the main line west of Winnipeg. This is more than half way from Winnipeg to the coast. Taking off a hundred miles on the west end, where steel is being laid from the middle of the unfinished line, would make 1,023 miles of track down, out of 1,750 miles west of Winnipeg, leaving only a little over 700 miles of road to be completed to open the way to Prince Rupert.

St. John, N.B.

[illegible] not to exceed $10,000.

St. Catharines, Ont.

It is understood that the much discussed high level bridge over the old Welland Canal here will be commenced. Among the [illegible]

Toronto, Ont. . .

The work of abolishing grade crossings between Bathurst street and the Humber will begin on May 1st and will be completed within two years, at an estimated cost of $2,000,000. The Grand Trunk Railway has decided to elevate four tracks and the city will pay one-third of the cost of elevating two tracks, the railway bearing the cost of the rest. The C. P. R. only possesses running rights over the G. T. R. tracks.

Vancouver, B.C.

At a meeting of property owners the plans for the widening of Bridge street from Fifth avenue, etc., were approved and a committee appointed to push the matter. Estimated cost, from $80,000 to $10,000.

Windsor, Ont.

Announcement has been made to the effect that th eMichigan Central Railway will build another line of track from Buffalo to this city, paralleling the present double track. Construction work will be commenced in June, directly after the opening of the new tunnel.

Winnipeg, Man.

A programme of construction amounting to about $30,000,000 has been announced by General Manager Bury of the Canadian Pacific western lines. Two large bridges, one at Edmonton, included in the list of new undertakings, and a line from Weyburn to Lethbridge. Details to be determined later.

In discussing the Brown-Brant street bridge it was decided to proceed with the piers according to the specifications and form of tender, but it has not been definitely decided as to when the structure will be erected.

AWARDED.

Cummings Cove, N.B.

The contract for the construction of a wharf at Cumming's Cove, Deer Island, Charlotte county, New Brunswick, has been awarded to Thomas P. Charleson, of Ottawa, at $16,890.

Fort Frances, Ont.

P. P. Elliott, timber contractor, has a contract to take out 250,000 ties for the C. N. R. Company. The Northern Construction Company have also a contract for the same company to take out 200,000 ties. Camps are situated near Banning.

Outlook, Sask.

[illegible] for the construction of the pedestals of the [illegible] wan river. Length of bridge, 3,000 feet [illegible] wooden piles, each 50 feet in length, will [illegible]

Toronto, Ont.

The Temiskaming & Northern Ontario Railway Commission has awarded a contract to the Canadian Car & Foundry Company, of Montreal, for three cafe cars of the most modern type.

Public Buildings, Churches, Schools, etc.

Aylmer, Ont.

At a meeting of the Ladies' Institute a new hospital was discussed, and a movement will be started for its erection. Dr. A. Backus, this place, is interested.

Dunboyne, Ont.

Tenders are being received by Dr. Brown until February 19th for the erection of a new brick Methodist church. Plans, etc., at residence of Dr. L. A. Brown, Water street, Aylmer. Irvin McTaggart, secretary.

Edmonton, Alta.

Tenders are being called for the new $100,000 tewelve roomed school to be erected by the Public School Board on Seventeenth street north of Jasper avenue. It is the intention to have the school ready for occupation in September.

Falls View, Ont.

The ratepayers have decided to purchase a site on Dunn street for a 4-room school house. Mr. Marshall, school inspector. Mr. Borter, Niagara Falls, architect.

Gilbert Plains, Man.

Tenders are being called until February 19th for the erection of a six-room school buillding for the trustees of Brickburn S. D Plans, etc., at the office of the secretary-treasurer, this place, or at the office of the architect, J. H. Bossons, Dauphin, Man.

Goderich, Ont.

The Masonic Temple Association are calling for tenders until February 21st for the different trades for the erection of a Temple. For further particulars see advertisement in this issue.

Killarney, Man.

A town hall to cost $12,000 will be built. A heating plant to cost $3,000 is being considered.

New Westminster, B.C.

It is stated that the congregation of St. Andrew's are contemplating the erection of a new church in a year or so.

Outlook, Sask.

A new $20,000 school will be erected here this spring.

Ottawa, Ont.

It is stated that the new Ottawa Masonic Temple will be started early in the summer and will cost about $60,000. Noted in issue of January 12th.

At the meeting of the public school board it was decided to build a new eight roomed school on Breeze Hill. Trustee Fairbairn, chairman.

Perth, Ont.

Wm. Dawson, county clerk, is advertising in this issue for competive plans for the new registry office.

Portage la Prairie, Man.

It is stated that an engineer will shortly undertake the work of lalying out the grounds for the proposed new armory. Tenders will be called shortly. The Industrial Exhibition Association has secured a draft-ed outline of plans for the proposed new grand stand. Estimated expenditure, $4,000 to $5,000. Date of completion, about May 24th.

Peterboro, Ont.

A Presbyterian church will likely be built at Buckhorn this summer.

Port Colborne, Ont.

It is expected that a lighthouse will be built off Point Abino east of here for the protection of shipping at that point. It is estimated that it will cost $75,000.

Port Arthur, Ont.

The Y. M. C. A. and city have reached an agreement for placing a fine new Y. M. C. A. building in Waverly Park, construction to commence in the spring. The Carneglie library will also be commenced in the park in the spring. John Whallen, owner of the Lyceum theatre, recently opened here, will build an equally good $75,000 theatre in Fort William.

Regina, Sask.

Nay & James, investment bankers, have purchased the following school debentures issued for building purposes: Harris School District, Harris, Sask., $14,000; Belton School District, Unity, Sask., $1,600; Merry Home School District, Petrofka, Sask., $800; Elphinstone School District, Elphinstone, Man., $2,800; Aylesbury School District, Aylesbury, Sask., $500; Loudon School District, Winnipeg, Man., $2,000; Ridgeway School District, Carmangay, Alta., $1,500.

Saskatoon, Sask.

The University of Saskatchewan is calling for tenders for the College building, students' residence, etc. For further particulars see information in this issue.

St. John, N.B.

The St. Andrew's Society have the matter of a new building under consideration. Dr. J. R. McIntosh, president.

It is stated that property on the northern side of Paradise Row between Wall and Harris streets has been bought by J. W. V. Lawlor, who, it is said, is acting for Bishop Casey. Rumors have it that a Catholic school may be erected there at some future date.

The Elks of this city are considering the erection of a building of their own.

Toronto, Ont.

At the annual meeting of the County of York Law Society it was resolved that a committee be authorized to deal with the question of a new registry office.

Sherbourne Street Methodist Church has secured an option on the northwest corner of Elm avenue and Dunbar road, where when the need occurs they may build a new church. In the meantime it is stated that a Sunday school may be erected on the property. Some changes on their present edifice are also planned.

At a recent meeting of the Board of Education a motion was put by Trustee Levee to build a new school on Manning avenue site. Rough plans for the Technical School have been prepared by Superintendent Bishop. Mr. Simpson, Chairman.

It is reported that the Provincial Government has been negotiating for the property on Bloor street east owned by the Board of Education, as a site for the new Government House. Other sites also are under consideration. In this connection it is stated that the railroads have offered to purchase the present Government House.

Toronto Rowing Club's new Iseland headquarters, it is stated, will be ready for occupation by 1st of June.

Tenders addressed to J. O. Reaume, Minister of Public Works, will be received until March 1st for masonry, cut stone, etc., required in connection with the extension to the Ontario Government Buildings, Queen's Park. Plans, etc., at office of G. W. Gouinlock, architect, 1108 Temple Building, Toronto. See advertisement in this issue.

Victoria, B.C.

The residence of Oak Bay are feeling the necessity of a new school.

Vancouver, B.C.

The Vancouver Rowing Club at their annual meeting to be held in March will consider the proposition of the erection of a new club house and quarters.

Watford, Ont.

Tenders for remodelling the school building in S. S. No. 17, Warwick, 2nd line, S. F. R., will be received up to March 1st, 1910. For particulars apply to E. Doan, secretary, Watford P. O.

Winnipeg, Man.

Plans are being prepared for the First English Lutheran Church to be built corner Ellice avenue and Furby street.

The Manitoba Fishing & Hunting Club will erect a club house and pavilion costing $10,000 at Pointe du Bois.

The Dominion Government are to expend $50,000 in the refitting of the old post office for customs parcels office.

At a meeting of the Riverview Presbyterian congregation it was decided to enlarge and practically reconstruct the present building at a cost of about $3,000. Rev. J. Irvine Walker, pastor.

Two collegiate institute buildings, each to cost not less than $125,000 and to contain from twenty to twenty-five rooms, and one or two public schools of modern type will be built in Winnipeg this year. The money for these buildings is in hand, having been voted by the people last falll.

Yorkton, Sask.

Architect La Chance, of Saskatoon, has completed plans for a collegiate institute.

Tenders for post office fittings, this place, will be received until February 16. Plans and specifications on application to James Christie, clerk of works, Yorkton, and Napoleon Tessier, secretary, Department of Public Works, Ottawa.

AWARDED.

Kingston, Ont.

W. J. Chapman, of Kingtson, has been awarded the contract for fittings in the ordnance stores, this city, at $2,165.

Victoira, B.C.

The Y. M. C. A. have awarded the contract for the removing of houses on site to Oliver Johnson; that for excavation work to John Haggerty. R. L. Drury, chairman, building committee.

Residences

Brandon, Man.

A. E. Bullock, contractor, has taken out a permit for the construction of an apartment block on Fourteenth street, to cost $25,000. Plans are being prepared for two other apartment blocks, to cost about $75,000 each.

Montreal, Que.

Recent building permits include: Theo. Menard, 342A Laurier avenue, two houses containing four dwellings, cost $5,000; Jos. Girard, 566 St. Germain street, house containing three dwellings, cost $3,000; L. Labcute, 16 Robillard street, house containing three dwellings, cost $2,900; Theo. David, 374 Amherst street, repairs to house containing four dwellings and one store, cost $2,800.

MacVicar & Heriot, architects, 104 Union avenue, have prepared plans and specifications for the erection of seven houses for Geo. Durnford, Esq. Tenders close February 11th at noon.

Saskatoon, Sask.

Architect W. W. La Chance has completed plans for a new residence for Mayor Wm. Hopkins.

Toronto, Ont.

Architects' plans have been prepared for the erection of a $200,000 apartment house on the southwest corner of Bloor and North streets. It has a frontage on Bloor of 92 feet by a depth of 114 feet.

It is stated the large apartment house will be erected on Sherbourne street north of the bridge on the west side. C. J. Gibson is at present working on the plans.

Building forecasts for Rosedale are as follows: Mr. J. D. Ivey, 152 Carlton street, plans building on the east side of Castle Frank avenue a large residence; Mr. G. B. Strathy will build on the south side of Highland avenue, it is stated, this spring; east of that point, Mr. H. Ryrie will build his large mansion, excavation of which has started, and which is estimated to cost about $60,000; Mr. H. C. Schofield, of Guelph, is preparing to build a $30,000 home; Mr. Joshua Donovan will build on the northwest corner of Schofield and Highland avenues, and Mr. W. H. Plant will also build on the south side of East Roxborough street.

Vancouver, B.C.

Plans have been completed by E. E. Blackmore and S. B. Birds for a handsome frame four storey apartment house for G. W. and S. C. Mortimore on the northeast corner of Robson and Bidwell streets. Estimated cost, $20,000.

Building permits have been issued as follows: C. T. Moore, 3035 Yukon street, $3,000; J. Hopps, 2253 Fifth avenue west, two houses, $4,000; S. Harris, 2456 Seventh avenue west, $2,500; J. Hopps, 716 Tenth avenue east, two houses, $5,000; W. P. Inkster, 557 Thirteenth avenue east, $2,100; J. L. McKenzie, 1046 Odlum drive, $2,000; Miller & Anderson, 2530 Howard street, $4,000; A. Radlett, 345 Fourteenth avenue west, $2,600; J. Dryden, 1714 Park drive, $5,000; J. Kennedy, 1411 Tenth avenue east, $2,000.

Winnipeg, Man.

It is stated that G. C. Brown, who has purchased the property at the corner of River avenue and Lewis street, frontage 100 feet, where he will erect an apartment block next season.

P. Calighan, contractor, intends to build about thirty houses this summer near the park, in Elmwood, ranging in price from $1,200 to $2,500. Worswick Bros. are starting four cottages on Johnson avenue, costing about $1,600. Grant & Simmers intend building twenty houses, mostly on Harbison avenue, which will run about $2,500 each.

AWARDED.

Montreal, Que.

Mr. C. Dufort, architect, La Patrie Building, has awarded the contract for the erection of flats for Mr. Joseph Grenier, on Atwater avenue, to A. Mongeau & Company. T. A. Morrison & Company have the contract for the supply of Roman stone.

Mr. E. Montgomery Roden, Beaver Hall Hill, has awarded the contract for the supply of leaded glass for three houses on Roslyn avenue to Messrs. Castle & Son, St. Catharines street west. The mantle work has been awarded to Mr. V. E. Traversy, Josephat Lane, Montreal.

The contract for the architectural ironwork required for the house being erected for Dr. Oliver on Park avenue has been awarded to Paul Beau & Company. E. Montgomery Roden, architect, Beaver Hall Hill.

Business Buildings and Industrial Plants

Andover, N.B.

The factory and foundry owned by A. E. Kupkey were destroyed by fire. Estimated loss about $3,000.

Brandon, Man.

It is announced that Clement Bros. will build a steel and concrete block at the corner of Rosser and Ninth. Estimated expenditure, $150,000. Building is stated to commence shortly.

Calgary, Alta.

H. L. Stevens & Company, of Winnipeg, have purchased four lots for $36,000 upon which to erect a large buillding.

Edmonton, Alta.

Construction will be commenced on April 1 on the new three storey building to be erected on Jasper avenue by the Molsons Bank.

Fort William, Ont.

The E. B. Eddy Company, of Hull, will erect a warehouse and branch here, it is stated.

Halifax, N.S.

The Fairview Laundry, owned by John Gough, at the Three Mile House, was destroyed by fire on the 1st inst. Estimated loss, $10,000.

London, Ont.

It is stated that the Hobbs Manufacturing Company, 304 Ridout, have decided to build a new plant next spring. Estimated cost about $25,000.

The building occupied by Forsythe, Fraser & Weir was damaged by fire on the 5th inst. Estimated loss on building, $8,000

Lachine, Que.

After considering a number of sites, the Lidgerwood Manufacturing Company, of New York (logging machinery, etc.), has made arrangements to locate their Canadian branch here.

Moose Jaw, Sask.

Work starts March 25 on the Imperial Oil Company's warehouse. Noted in issue of January 19th.

A member of the Board of Trade who recently interviewed F. W. Thompson in Montreal, states that decisions re locating Ogilvie mills in the west had been indefinitely postponed, owing to the question of government ownership of elevators being under consideration.

Merritton, Ont.

The Hough Block, occupied by Mrs. Hunniford and others, was badly damaged on the 3rd inst. Estimated loss, $5,000.

Montreal, Que.

The Canadian Northern Railway will have an uptown station in Montreal. A terminal will be built at Osborne street, adjoining the Canadian Pacific Railway's Windsor street station.

It is reported that the Barlow property on Peel street has been purchased by Douglas and Robert J. Inglis for some $50,000, and that they intend to erect a fine modern building on the property.

Outlook, Sask.

M. Jules, of Minneapolis, will erect a flour mill here, costing $40,000.

Port Arthur, Ont.

The Wagon & Steel Works will be commenced March 1st. W. J. Lindsay, manager. Noted in issue of January 12th.

Quebec, Que.

Mr. Lorenzo Auger, of Quebec, is at work preparing plans of a fifteen storey hotel to be erected at the foot of Mountain Hill. Estimated expenditure, $1,000,000, subscribed mainly by Americans. According to rumor it will be the National Transcontinental Hotel in Quebec.

Salisbury, N.B.

The general store and warehouse of H. C. Barns & Sons here was destroyed by fire on the 4th inst. Estimated loss, $11,000.

Rainy River, Ont.

John Stinson, of Norwood Grove, Man., is to erect a stave factory here in March.

Ryley, Alta.

Excavation has been commenced on the site for the new Allberta Hotel.

Finsith Bros. will have a large store buildling erected.

Rapid City, Man.

W. J. Lindsay & Company will have a large oatmeal mill erected here.

Regina, Sask.

B. F. Ackman Sons Company, of Peterboro, Ont., will erect a large warehouse and office here this coming spring.

The building for the International Harvester Company will be a 3 storey brick, 100 x 200 feet.

It is reported that the plans filed by the C. P. R. for the proposed new union station for Regina call for a building costing between $500,000 and $600,000. The length of the new depot is to be 480 feet and a portion of it will be four storeys high, affording accommodation for the necessary executive offices at this point of three railways using the station, viz., C. P. R., G. T. P. and C. N. R.

Saskatoon, Sask.

Plans for the Wilson Bros. building are completed. W. W. La Chance, architect.

The Kemnick Sand & Stone Company, Limited, will put up a $60,000 brick manufacturing plant here.

Salisbury, N.B.

The general store and warehouse of H. C. Barnes & Son, here, was destroyed by fire on the 3rd inst. Estimated loss, $11,000.

Stratford, Ont.

Vice-president Fitzhugh, of the G. T. R., states that a new station, most modern in design, will be erected in Stratford this year. Regarding the expected addition to the local shops, plans are now under consideration. It is understood from other sources that the plans [illegible]

Sidney, Man.

The Sidney Hotel and general store of A. Hunter were destroyed by fire on the 6th inst. Estimated loss, $10,000.

St. John, N.B.

The brick block occupied by the [illegible] Company, wholesale [illegible]

(Continued on page [illegible])

Tenders and For Sale Department

TO CONTRACTORS

Sealed tenders will be received by the undersigned up to noon on FEBRUARY [illegible], 1910, for all trades required in the erection of a residence in Chestnut Park, Toronto.

The lowest or any tender not necessarily accepted.

F. S. BAKER, Architect.
Traders Bank Building, Toronto.

Proposals

Tenders are wanted for a supply of UNDERGROUND CABLE.

For information apply at once to HYDRO ELECTRIC SYSTEM, City Hall, Toronto 6

Tenders for Church

Tenders will be received by the undersigned until noon on SATURDAY, FEBRUARY 19, 1910, for the work of the various trades required in the erection of a church building on the corner of Queen Street West, and Beaty Avenue, Toronto, for the Church of the Epiphany.

The lowest or any tender not necessarily accepted.

GORDON & HELLIWELL, Architects,
6 Confederation Life Building, Toronto.

Tenders for
Gaol Heating

Tenders will be received by the undersigned up to noon on WEDNESDAY, the 16TH DAY OF FEBRUARY, 1910, for the heating of the County Jail at the Town of Barrie, according to plans and specifications which may be seen on application to A. W. Beardsley, County Clerk's Office, Court House, Barrie. All tenders to be sealed and marked "Tenders for Gaol Heating" and addressed to

C. J. PICOTTE,
Chairman County Property Committee
6 Box 128, Penctanguishene. Ont.

City of Moose Jaw

Notice

Tenders will be received for two (2), two-horse street sprinklers, steel tanks.

Tenders stating capacity and weight, giving prices f.o.b. Moose Jaw, to be laid on the council table not later than 8.30 p.m., on MONDAY, FEBRUARY [illegible]

THE CITY OF MOOSE JAW
W F. Heal, City Clerk.

Tenders

The University of Saskatchewan will shortly call for tenders for the

College Building, Students' Residence Power House, Live Stock Pavilion, Agricultural Engineering Building, Horse Barn and Cattle Barn

Those interested should communicate with the Architects, BROWN & VALLANCE, Canada Life Building, St. James St., Montreal, or PRESIDENT MURRAY, University of Saskatchewan, Saskatoon, Sask. 7

Tenders for Plastering

Tenders will be received by the undersigned for plastering a large house in Gravenhurst (labor only), the owners supplying all material on job. For particulars apply at once to BISHOP CONSTRUCTION CO., LTD., 19 Wellington St. West, Toronto. 6

Tenders Wanted

Tenders will be received up to noon of FEBRUARY 21ST, 1910, from the different trades for the erection of a Masonic Temple, 58 x 70 feet, three stories and basement, in the town of Goderich; building to be of concrete, brick and stone. Plans and specifications may be seen at Andrew Porter's office, North Street, Goderich The lowest or any tender not necessarily accepted. A marked cheque for five per cent. of the amount must accompany each tender.

MASONIC TEMPLE ASSOCIATION
OF GODERICH, LIMITED.
ANDREW PORTER,
6 Secretary-Treasurer.

Notice to Contractors

Tenders for 42 inch Steel Intake Pipe

Sealed tenders addressed to the Chairman of the Water Works Committee will be received by registered post only, up to 5 p.m., TUESDAY, FEBRUARY 15TH, 1910, for the supply and delivery of 3,000 lineal feet of 42 inch steel intake pipe.

Specifications, form of tender and full particulars may be obtained on application to the City Engineer's Office, City Hall, Ottawa.

The Corporation does not bind itself to accept the lowest or any tender.

NEWTON J. KER,
City Engineer.
Ottawa, January 24th, 1910. 6

County of Perth

Competitive Designs for New Registry Office.

Competitive Designs for a new Registry Office in the City of Stratford, will be received by Wm. Davidson, County Clerk, on behalf of the County Property Committee, up to one o'clock p.m., MARCH 1ST, 1910.

The building to be 34 x 50 feet, one story with basement. Outside walls to be of white stock brick basement of best St. Marys stone. Cost not to exceed $10,000.00, including steam heating.

The plans showing the greatest efficiency in fire-proof construction and general design will be accepted when approved by Government Inspector. Plans not accepted will be returned. The architect whose plans are accepted will be required to prepare specifications, detail drawings, etc. A short description of general construction of the building to accompany plan.

Any further information can be obtained by communicating with the County Clerk.

WM. DAVIDSON,
County Clerk,
Stratford P.O.
ROBERT ARMSTRONG,
Chairman of Committee.
Stratford, February 1st, 1910. 7

Tenders for Supply of Asphalt

Sealed tenders, addresed to the Chairman, Board of Control, for the supply of from 2,500 to 3,500 tons of Asphalt for street paving for the City of Winnipeg, will be received at the office of the undersigned up to 11 a.m. on FRIDAY, FEBRUARY 25TH, 1910.

Specifications and forms of tender, together with conditions governing tenders as prescribed by By-law may be obtained at the office of the City Engineer, James Street Winnipeg The Board reserves the right to reject any or all tenders or to accept any bid which appears advantageous to the City.

M. PETERSON,
Secretary.
Board of Control Office, Winnipeg, Jan. 31st, 1910. 7

To Contractors

Sealed bulk or separate tenders endorsed "Tender for addition to Ontario Parliament Buildings" addressed to the undersigned, will be received at this department until noon on

Tuesday, the first day of March, 1910

for the following works, viz.: Masonry, bricklayer, cut stone, carving, fireproofing, etc.; structural steel; steam heating; plumbing and gasfitting; iron armored conduit and electric wiring; vault doors; roofing, copper and sheet metal; carpenter work; ornamental iron and grille work; elevators; lathing and plastering; painting and glazing; marble and tile; metallic fire-proof doors, base and trim; hardware; iron-founders work; required in connection with the extension to the Ontario Government Buildings, Queen's Park. Plans and specifications may be seen at the office of Geo. W Gouinlock, Architect, 1108 Temple Building, Toronto.

An accepted bank cheque payable to the order of the Honorable, the Minister of Public Works for five per cent of the amount of the tender and the bona-fide signatures and addresses of two sureties or the bond of a Guarantee Company approved by this Department prepared to give a bond for the due fulfillment of the contract must accompany each tender. Cheque will become forfeit to the Crown in the event of the successful tenderer refusing to carry out the work within ten days after the acceptance. The Department will not be bound to accept the lowest or any tender.

J. O. REAUME,
Minister of Public Works, Ontario

Department of Public Works, Ontario.
Toronto, February 4th, 1910.

(Newspapers publishing this advertisment without authority will not be paid for it.) 8

Miscellaneous

TILLSONBURG, ONT.—Good opening for an Engineer and P.L.S Town of Tillsonburg. Population 3,000. Town would require part of his services for Public Works. Apply to A. E. RAYNES, Town Clerk. 6

Fine Factory Site—New Westminster, B. C., the coming factory city Lot 7. Block 36; corner 198 x 132, three frontages; close to tracks and waterfront. Right in city, and already surrounded by industries. $15,000. Snap. Will bring double this inside two years. Investigate. Address P. O. Box 516, Vancouver—owner 7

For Sale

A 60,000 gallon Water Tank on Steel Trestle, 90 ft. high.

Sealed tenders addressed to the Chairman of the Water Works Committee, endorsed "Tender for Water Tank", will be received by registered post only up to 5 p.m. TUESDAY, MARCH 1ST, 1910, for the purchase removal of a 60,000 Imperial Gallon Wooden Tank and mounted on a steel trestle, 90 ft. high, at the Ottawa East Pumping Station.

Particulars may be obtained on application to the City Engineer's Office, City Hall, Ottawa.

The Corporation does not bind itself to accept the highest or any tender.

NEWTON J. KER,
City Engineer.

Ottawa, January 25th, 1910. 7

Business Buildings and Industrial Plants

(Continued from page 23)

crockery merchants, and others, was gutted by fire on the 22nd ult. Estimated loss, $20,000.

Swan Lake, Man.
The branch of the Bank of Hamilton here was destroyed by fire on the 1st inst. at an estimated loss of $10,000. Manager, Mr. Lusteed.

Toronto, Ont.
The Lowndes Company, Limited, has purchased property No. 129 Wellington street, for $20,000, where they will shortly erect a large warehouse. The deal was put through by Mr. Harton Walker.

It is stated that Sir William Mulock's property on the northwest corner of Yonge and Grenville streets, has been purchased by the Burgess Powell Drug Company for $80,000. The property is 100 feet by 100. The buyers will put a fine drug store on the corner.

Victoria, N.B.
It is stated that the Cowper property on Fort street, lying between the Times corner and D. E. Campbell's, was purchased by His Honor the Lieut.-Governor. It is understood to be the intention of the new owner to improve the property, and to erect a substantial building for stores and other purposes.

Vancouver, B.C.
A pork packing house are seeking a location in this city. Messrs. H. Gains & Sons of Dewdney are interested.

A company, known as the Metropolitan Building Company, it is stated, will build a ten storey block on the north side of Hastings street west. As soon as plans are completed work will be started.

Welland, Ont.
The officials of the Hedlay [illegible] Milling Company state that the construction of their big mill at Port Colborne will be commenced in the spring.

Wetaskiwin, Alta.
Several business buildings were destroyed by fire on the 30th ult. Those who suffered loss: Lee Wing, [illegible] Bleiler, $4,000, and others.

Winnipeg, Man.
The Lewis Furniture block was damaged by fire on the 3rd inst. Estimated loss, $15,000. W. B. Paine, manager.

It has been announced that the T. Eaton Company has secured 325 feet on the [illegible] side of Hargrave street with a depth of 120 feet. Ultimately this site will be used for a large factory. Mr. Gilroy, local manager.

Mr. Geveart, a Belgian woollen manufacturer, is quoted as having stated that sufficient capital has been raised towards the projected site for a mill. Amount of capital involved, about $350,000. Noted in issue of December 22nd.

It is rumored that a new garage will be built for the Winnipeg Taxicab Company this spring.

The Munro Steel & Wire Works, Limited, will rebuild at a cost of $30,000.

Frank Lindsay, proprietor of the Oxford Hotel, will have a large store and apartment block built, on Garry street and Notre Dame avenue.

The lot adjoining the warehouse of the Winnipeg Paint & Glass Company has been sold to a representative of foreign capital. The purchasers will build on the property. Montagu Aldous & Laing made the sale.

The Berna Motor & Taxicab Company will builld a 4-storey building corner of McDermot and Princess streets. Kilgour-Rimer Company are interested.

Tenders are being taken on the Paulin-Chambers building, Ross avenue, cost $85,000. Noted in issue of January 19th.

R. R. Pattinson and W. W. Fraser will have a store and apartment block built, corner Corydon avenue and John street.

The Northern Foundry & Machine Company will put up a foundry at Point Douglas to cost $10,000.

The Canadian Bank of Commerce are having plans prepared for a building on their old site with a frontage of 105 feet.

AWARDED.

Edmonton, Alta.
The general contract for the building of the new Senate hotel on the corner of Clara street and Fraser avenue has been awarded to G. C. Porter, of this city, at $50,000. Plans call for a three storey building of pressed brick with Roman stone trimmings.

St. John, Nfld.
The contract for the elevator enclosures for the Bank of Montreal building has been awarded to Messrs. Hutch & Stitcht. Messrs. Peden & McLaren, architects, Montreal.

Power Plants, Electricity and Telephones

Cranbrook, B.C.
[illegible] it is stated, purpose erecting a power plant on the St. Mary's river at an early date, when the present steam power station will [illegible]

Dunnville, Ont.
[illegible] will be asked to vote on a by-law to [illegible] amount of $10,000 for the purpose of [illegible]

Fort William, Ont.
Rapid progress is being made by the [illegible] tant, finished during the coming summer. [illegible]

It is stated that the Kaministiquia Power Company has under construction over 10 miles of transmission lines to supply the demands of its new customers. The present plant is laid out for 50,000 h.p.; the present output is 15,000 h.p. It is expected that another 10,000 h.p. unit will be installed in the near future to meet the rapidly increasing demands. W. L. Bird is secretary and manager.

The Allis-Chalmers-Bullock Company has completed the installation of a 1,000 h.p. motor generating set in the power station of the Kaministiquia Power Company at Fort William to supply electricity for the street railway between Port Arthur and Fort William, which is owned jointly by the two cities. Four new cars have been received and eight more have been ordered. Double tracking of the system throughout will be completed during the coming summer. N. C. Pilcher is general manager of the street railway.

Hope, B.C.
The Fraser River Land Company, a corporation just formed, is planning to erect an electric power plant here and has applied to Water Commissioner Fletcher for a record of 1600 cubic feet of water from the Coquahalla river.

Montreal, Que.
The Allis-Chalmers-Bullock, Limited, have been awarded contracts for the mining machinery as follows: Northern Customs Concentrators, Cobalt, Ont., one No. 4 Gates "K" Breakers, fitted with short head, concaves, chilled iron, cast iron gears, steel pinions, etc.; Jacobs Asbestos Company, Thetford Mines, Que., four No. 4 Gates "K" Breakers, fitted with short head, concaves, chilled iron, cast iron gears, steel pinions, etc.; Black Lake Consolidated Asbestos Company, Black Lake, Que., four No. 4 Gates "K" Breakers, fitted with short head, concaves, chilled iron, cast iron gears, steel pinions, etc.

Ottawa, Ont.
Five or six years ago, it is stated, Hon. Mr. Domville secured a charter for the Northern Commercial Telegraph Company, Limited, which charter enables the company to run telegraph and telephone lines from and to Quebec, Montreal, Ottawa, Toronto, Niagara Falls, Hamilton, Detroit and a section between Emerson and Winnipeg, and also from Quebec and Montreal to the Maritime Provinces. The capital is £750,000 (sterling), and a company has been organized and it is now stated that the contract for one thousand miles of the work has been given to M. Connolly, the well-known contractor. Roeblings, the great copper wire manufacturers, are said to be practically the company.

Port Arthur, Ont.
The city of Port Arthur has closed a contract with the Hydro-Electric Power Commission for from 5,000 to 10,000 h.p. The power is to be supplied from the plant of the Kaministiquia Power Company at Kakabeka Falls. Work will commence at once on the construction of the transmission lines and substation. W. L. Bird, of [illegible] manager of the Kaministiquia Power Company

St. John, N.B.
The St. John Railway Company are planning to construct a new building, which with the use of the old power house for [illegible]

Toronto, Ont.
[illegible]

the system. For further particulars see advertisement in this issue.

Winnipeg, Man.

The court has handed down a decision that the Winnipeg Electric Railway Company cannot legally transmit electricity from its hydro-electric power plant at Lac du Bonnet, on the Winnipeg river, 60 miles distant, into this city for commercial purposes. Action was brought by the city against the railway company in 1906, arising out of the distribution of electrical energy generated outside of the city limits, which the city claimed was in violation of the company's franchise.

Tenders addressed to the Chairman of the Board of Control will be received until February 21st for the supply and installation of a cooling tower for the terminal station. Instructions, etc., at office of the power engineers, Carnegie library. M. Peterson, secretary.

AWARDED.

Edmonton, Alta.

The Canadian Carbon Company, Limited, 12-14 Shuter street, Toronto, have been awarded the Government of Alberta contract for the supply of cell batteries for their telephone system for the year 1910.

Nelson, B.C.

It is stated that the contract has been let by the Nelson Street Railway Company to the Allis-Chalmers Company of Montreal for a motor generator set of 250 kilowatt capacity. Two cars have been ordered from the Ottawa Car Company, each equipped with four 40 horse-power Allis-Chalmers motors and each seating 40 passengers. A substation and a car barn in accordance with the requirements of the system are now under construction and will be ready for service at the time specified in the contracts.

Vancouver, B.C.

It is stated that the contract for the initial hydro-electric equipment of the new power plant which the B. C. E. R. Company is constructing on the Jordan river has been awarded to the John McDougall Caledonian Ironworks, 512 William street, Montreal, Que., the equipment to be ready for operation by October 1. The ultimate plans for the plant contemplate the installation of four electrical units. The present contract covers the first unit, which will be operated by a Doble impulse water-wheel of 10,000 horse-power, the surplus energy being available when future electrical units are provided. The development plans on the river call for the construction of a pipe line nearly two miles in length, the water being delivered at the power house at tidewater at a head of 1180 feet. Contracts involve an expenditure of $53,000. G. M. Breed, local manager for Caledonial Ironworks.

Miscellaneous

Armow, Ont.

Tenders are being called by the council of the Township of Kincardine for timber and cement tile, same material to be delivered on or before the first of June. R. B. Campbell, clerk.

Brockville, Ont.

The county council recently decided to expend $200,000 on the construction of roads, and a commission was appointed to engage an engineer. Write Warden Morris.

Como, Que.

A bylaw will come before the ratepayers to issue $30,000 5 per cent. 30-year road and bridge debentures. A. W. Mullan, secretary-treasurer.

Fort William, Ont.

Tenders are being called by the city until February 10th for the supply of 440 cords of flat rock of 3 1-2 to 5 inches in thickness and to be delivered before May 1. A. L. Farquharson, construction superintendent.

Kingston, Ont.

Tenders addressed to W. W. Sands, city clerk, will be received until February 11th for one steam fire engine, 600 gallons capacity. Specifications on application to the chief of the fire department.

Port Arthur, Ont.

A committee of the City Council has been appointed to develop a scheme for instituting a gas plant here, and an inducement will be offered several companies with whom the city has been in communication.

Peterboro, Ont.

Chairman Morgan of the Fire, Light and Water Committee, is considering the advisability of purchasing a new chemical engine. The committee recently decided what supplies they will purchase for this year.

St. John, N.B.

The Common Council decided to call for tenders for a new boiler for No. 3 fire engine. Mayor Bullock, Ald. Hayes, members.

South March, Ont.

Tenders addressed to Thos. Richardson, clerk of the township of March, will be received until March 1st for dredging work on the Carp river in the townships of March and Huntley. Plans, etc., at office of Messrs. Beament & Armstrong, 25 Sparks street, Ottawa. J. H. Moore, civil engineer.

Toronto, Ont.

Recent building permits include: J. Bryant, pair semi-detached two storey brick dwellings, Delaware avenue, $4,500; G. Constable & Son, pair semi-detached two storey brick stores and dwellings, Bloor street west, $6,000; A. H. Garrett, one storey brick theatorium, on 622 Bloor street west, $3,500; G. Phillips, pair semi-detached two and a half storey brick dwellings, Winchester and Sackville, $4,800; Dundas Building Company, three attached two storey brick buildings, Maria and St. John storey brick dwellings, corner Maria and St. John's Place, $5,500; H. Carter, pair semi-detached two storey brick dwellings, Yarmouth, $4,000; H. Pickering, pair semi-detached two storey roughcast dwellings, brick fronts, Rhodes, $3,000; A. J. Miller, two and a half storey brick dwelling, Hewitt, $3,700; J. Isolsky, pair semi-detached two storey brick dwellings, Eastern, $4,000; H. S. Mara, three attached one storey brick stores, corner College and Beatrice, $3,700; Prof. Owen, two storey brick dwelling, on Wychwood park, $5,700; W. Green, 6 pair semi-detached two storey roughcast dwellings, brick fronts, Frizell, $18,000; T. Weber, pair semi-detached two storey brick dwellings, Simcoe, $4,000; R. C. Bustard, six attached two storey brick stores and dwellings, corner Yong and De Lisle streets $15,000; F. W. Halls, two storey and attic brick dwelling, near Ridoubt, Indian road, $4,500; Deeth & Sons, two and a half storey brick dwelling, corner Indian road and Thorold street, $3,000; R. W. Tuthill, three attached two and a half storey brick dwellings, and garage, King street west, $13,000; A. Russell, pair semi-detached two storey brick dwellings, Delaware, $5,000; L. E. Price, pair semi-detached two storey brick dwellings, Salem, $3,900; Canning & Curry, pair semi-detached two storey roughcast dwellings, brick fronts, Shaw street, $3,400; Harry Ryrie, two storey brick dwelling, Highlands avenue, $22,000; Deeth & Sons, two and a half storey brick dwelling, Indian road, $3,000; T. Eaton Company, alterations to store, 190 Yonge, $4,500; Lever Bros., one storey brick factory Eastern avenue and Don roadway, $27,000.

Victoria, B.C.

Estimates of the fire department have been passed, including hose $2,500; hydrants, $5,000; fire alarm system, $2,500; apparatus, $3,000.

Tenders are invited for 75 hydrants required by the first department.

Tenders will shortly be called for a motor chemical wagon for the fire department to cost about $2,000.

The city is calling for tenders for 150,000 gallons of creosote, and until the receipts of bids Acting City Engineer Bryson will purchase what creosote he requires for treating wood blocks. A rigid inspection of the material will be made, as last year it was found to be of inferior quality.

Permits have been issued recently to S. White for a brick stable on View street to cost $8,000; to S. Rowe for a dwelling on Suffolk street to cost $2,000; to Mrs. M. M. Sprinkling for a house on Grant street to cost $400; to Hon. Abraham Smith, U. S. consul, for a dwelling on McClure street to cost $4,000.

Vancouver, B.C.

Engineer Clement will shortly ask for tenders for 10 miles of cement sidewalk. He wil lalso call for tenders for block paving on Westminster avenue from Broadway to the city limit and for two gravel scows of about 125 tons capacity, to cost in the neighborhood of $3,000 each.

The following is City Engineer Clement's estimates for the year 1910: New plank walks, $22,000; street improvements (not under by-law), $40,000; other construction and improvements including the reconstruction of the old Granville street bridge at $23,500, will reach $50,460, and some $45,000 odd will be needed for the scavenging maintenance after an estimated revenue of $12,000 has been subtracted.

Winnipeg, Man.

The appropriations for the city's expenditures are itemized as follows:—Power works, $850,000; water works, $161,978.62; new police stations, $75,000; alteration of old police stations, $20,000; Louise bridge, 107,395; electrical works, $28,125; fire alarm system, $35,000; parks, $150,000; conduits, $50,000; local improvements, $955,834.71.

Tenders addressed to the chairman of the Board of Control will be received until February 21st for the supply of 25,000 barrels of cement, delivered f. o. b. Winnipeg. Specifications, etc., at office of city engineer. M. Peterson, Secretary.

AWARDED.

Brandon, Man.

The Brandon Gas Company has let a contract for the laying of thirteen miles of mains during the coming season.

Halifax, N.S.

The contract for building a boat for the quarantine service at Halifax has been awarded to Philip & Son, Dartmouth Eng., for $22,600. The highest tender was that of Toronto Shipyard, Toronto, $39,850; the Burrel-Johnson Iron Company, $32,750. The others ranged from $28,000 to $35,000.

Strathcona, Alta.

The contract for city house numbering has been awarded to Mr. J. M. Eaton.

We Have Always in Stock:
at all our yards

Crushed Stone

and

Crushed Granite

For Fireproof, Sidewalk or Road Construction

Cement **Building Stone** **Builders' Supplies**

C.P.R., Grand Trunk, M.C.R. and T.H. & B. Railway Delivery.

ROGERS SUPPLY COMPANY

Head Office: 3 King Street East, Toronto
Phone Main 4155

YARDS ;
Foot of Berkeley St.
Foot of Bathurst St.
Foot of Church St.
256 Lansdowne Ave.
C.P.R. Crossing North Toronto
G.T.R. Crossing Pape Ave.

Creosoted Wood Paving Blocks

cut from the log in our own mills out of live Douglas Fir and creosoted to specification as to Oil and Pressure. Capacity 1,000 yards per day.

Bridge, Structural and Mining Timbers

cut and sized to exact dimensions, and if so desired, framed in our yards before Creosoting.

Standard Creosoted Railroad Ties

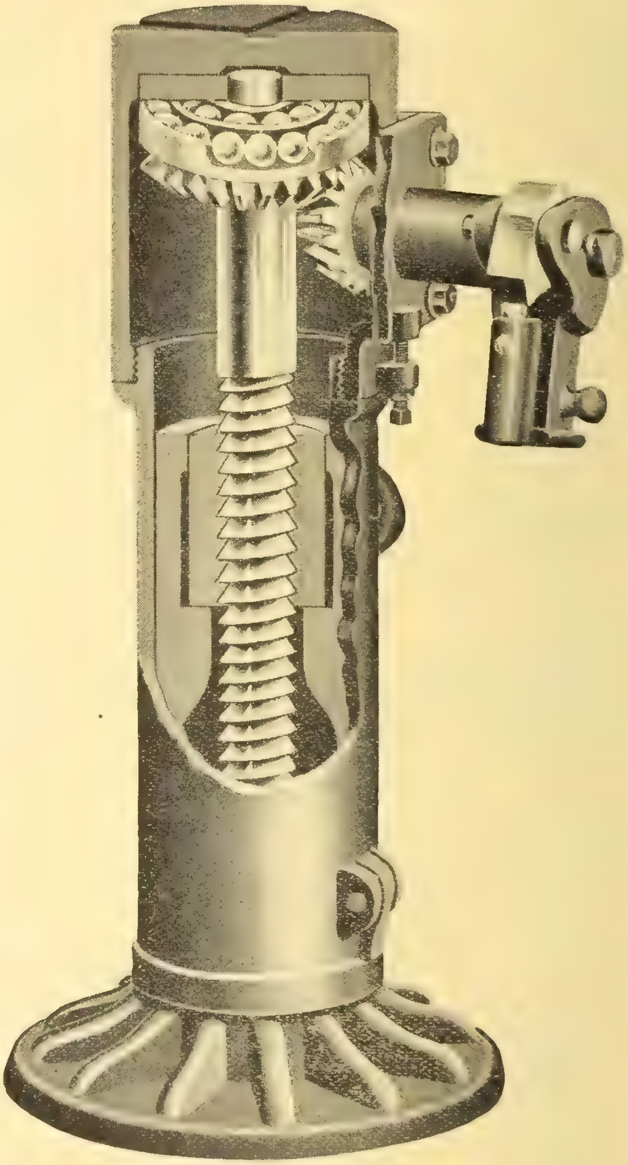
Capacity after March 1st, next, 1,200 ties per day.

Dominion Carbolineum Works Limited

Vancouver, B. C.

NORTO

A. O. NORTON BOSTON, MASS.



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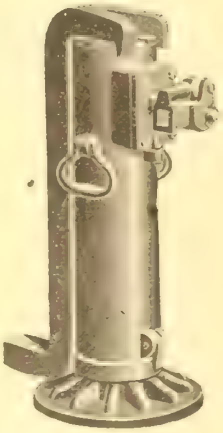

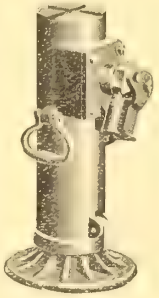

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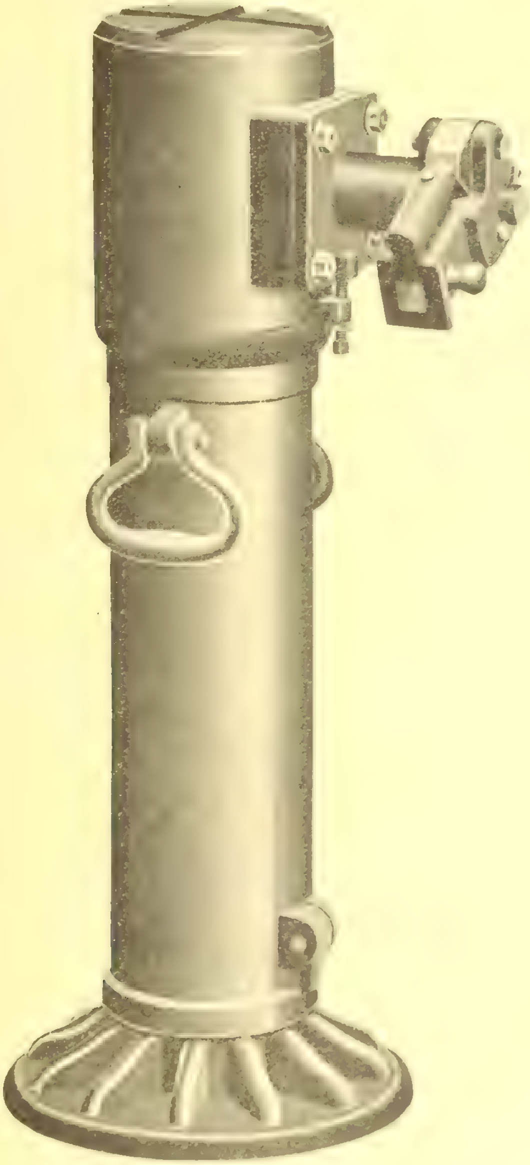

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LOGUE

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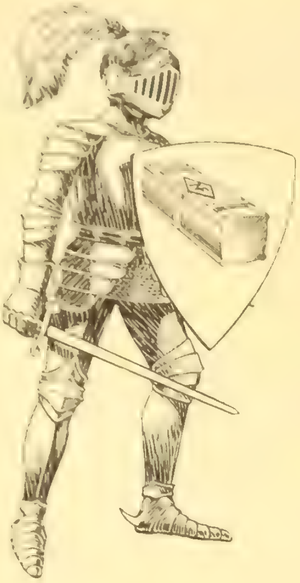
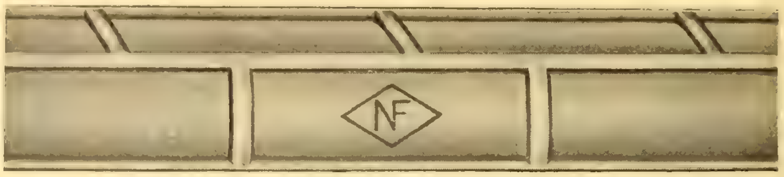
LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Vancouver - Metropolitan Bldg.

The Bar With the Brand is Your Protection





Registered under the Trade Mark and Designs Act.

Bear in mind that the

"NF" Reinforcing Bar for Concrete Construction

is a BRANDED BAR.

Our trade mark is rolled in the bar every three feet.

The reason we brand our product is simply because we believe in it, and want to protect it in every way we can.

Inferior products are often **not** branded, and this will apply largely to reinforcing metals. The "NF" bar is protected by a brand because it is **worthy** of a brand. It is made of the very best material by the most careful process.

We not only make the BAR, but we make also the STEEL the bar is made from. We are the only Steel Company in Canada which MARKETS DIRECT its **own** type of bar made from its **own** steel.

Absolutely no re-rolled metal is used by US. This is not a knock at competition, as it is pretty well known in the building trades that many mills **do use** re-rolled metal.

Consider, then, only the brand "NF" on the bar when making up specifications, and you will be safe.

ONTARIO IRON & STEEL COMPANY, LIMITED

Toronto, Ont., Canada

BRONZE ENTRANCE DOORS
Canadian Bank of Commerce, Vancouver.

Elevator Enclosures
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Utility and Art

It is an unfortunate circumstance that the design of many important buildings is influenced by those who have the most warped ideas on the subject. In many quarters there is a gross misconception of the architectural profession and there is an altogether too prevalent impression that the successful combination of utility and artistic appearance is impossible. Some idea of this misunderstanding is suggested by recent communications addressed to the Toronto Board of Education by the Canadian Manufacturers' Association and the Board of Trade. The last two named bodies, it would seem, had been consulted in regard to the plans for the new technical school on College street. Their views are interesting.

In the course of his letter, Mr. F. G. Morley, secretary of the Board of Trade, says: "Money should not be spent upon buildings with expensive elaborate exterior appearance but upon solid structures with sufficient available space. . . Some of the most famous technical schools in Germany are in buildings of a very unpretentious kind. . . . The school is not the building, it is the staff who teach, the spirit communicated, the ambition awakened, that will influence the industrial and scientific life of our country. This is the side we desire to urge and we are opposed to the erection of unnecessarily expensive buildings, which in a few years owing to changes in industrial methods, may be found unsuitable."

These sentiments are rather strongly developed on the utilitarian side, but it is not likely that any serious objection will be made to any of the views expressed therein. What these people do not realize, however, is that the solution of the problem lies in the plan. Neither do they appreciate the fact that the architectural profession stands for taste and not for unnecessary embellishment. While we would not presume to criticize the ability of the city officials, we do not hesitate to express the opinion that in this instance a better purpose would have been served, and a more satisfactory result obtained, in all probability, by calling for competitive plans. There would have been more chance of obtaining the proper, economic solution. There would have been a greater likelihood of some regard being had for the artistic as well as for the utilitarian, without any sacrifice of the latter—and at no additional expense.

We learn from the Board that plans for the new technical school are now under preparation, but have been unable to learn any particulars in connection with the design. There is an evident reluctance on the part of the authorities to impart any information of this kind just now. Whatever shape the plans are assuming, it is to be hoped that some regard will be had for the outward appearance of the building as well as for its general utility. It can only be admitted that such a building as a technical institute does not call for any elaborate architectural treatment; indeed, in this case, it would be almost impossible by reason of the site and limited amount of frontage on College street; but, at the same time, the Board of Education should not be persuaded, or coerced, into the erection of a barn. It will be interesting to see how they arrive at the solution of the plan for this new school. Certainly, it would have been more to our liking had the architectural profession been consulted.

Incidentally, it is gratifying to note that the Board of Trade has a certain anxiety for the ratepayers' pocket. Mr. Morley concludes by saying: "It is well to remember that we have . . . only the taxpayers of our city to furnish the needed funds, etc." This anxiety is very pleasing to note, but we are afraid that the average Toronto ratepayer has become inured by this time. Anyway, he can afford to pay for what is necessary in the best interests of the city.

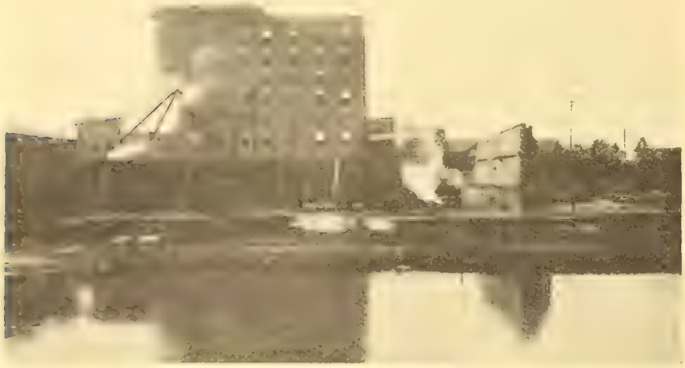
The mechanics' lien action of the Engineering Contracting Company, Baltimore, against the Canadian Birkbeck Company, arising out of the contract for the building of the defendant company's offices on Adelaide street, Toronto, is now being heard. Evidence has already been taken by commission at Baltimore, the president and secretary having been examined there. The contract was $131,000, and a lien has been filed for $30,000, as a result of a comparatively minor disagreement between the contractor and architect.

G. T. R. Construction at Ottawa, Ontario

The Story of Progress in the Erection of the New Depot and the Chateau Laurier—Interesting Views of the Work

The new G. T. R. depot at Ottawa, now in course of construction, will cover an area of approximately 25,000 square feet, and will involve an expenditure, in round figures of $1,000,000.

The structure was designed by Messrs. Ross & MacFarlane, architects, Montreal and Ottawa, and the general contract was awarded to Peter Lyall & Sons, of Montreal. The Dominion Bridge Company, of Lachine, Que., are erecting the steel work, and John Watson & Son, Montreal, have the contract for the ornamental iron work.

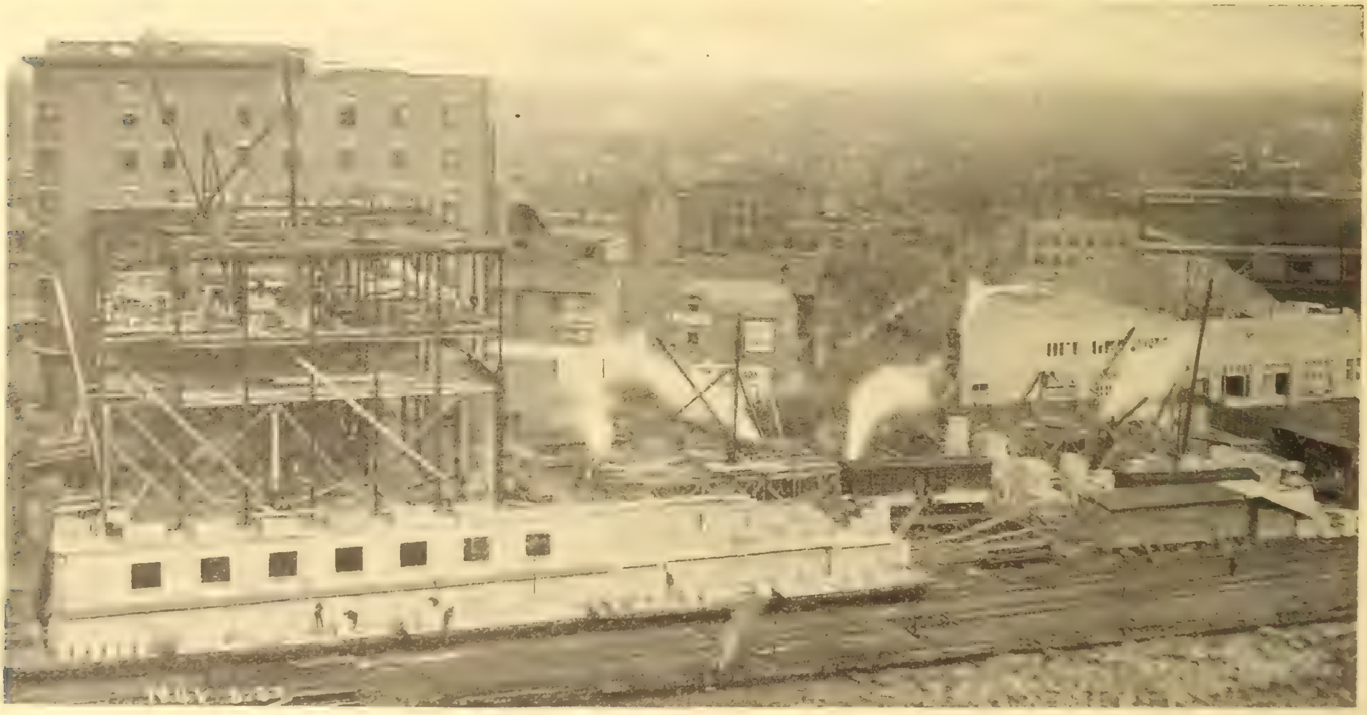


(Fig. 1) 1st October, 1909—Commencement of Steel Work

Excavations were commenced on July 12th last, and from the progress views, published herewith, it will be seen that remarkably good progress has been made during the six months that operations have been underway. The story of the work, up to its present stage, will doubtless be of interest to many of our readers.

In fig. 1 it will be observed that the demolition of the old station is incomplete and that a small portion of steel has been erected. Seven rock drills were employed in the work and at this stage these are in operation. (About 5,000 cubic yards of rock were excavated.)

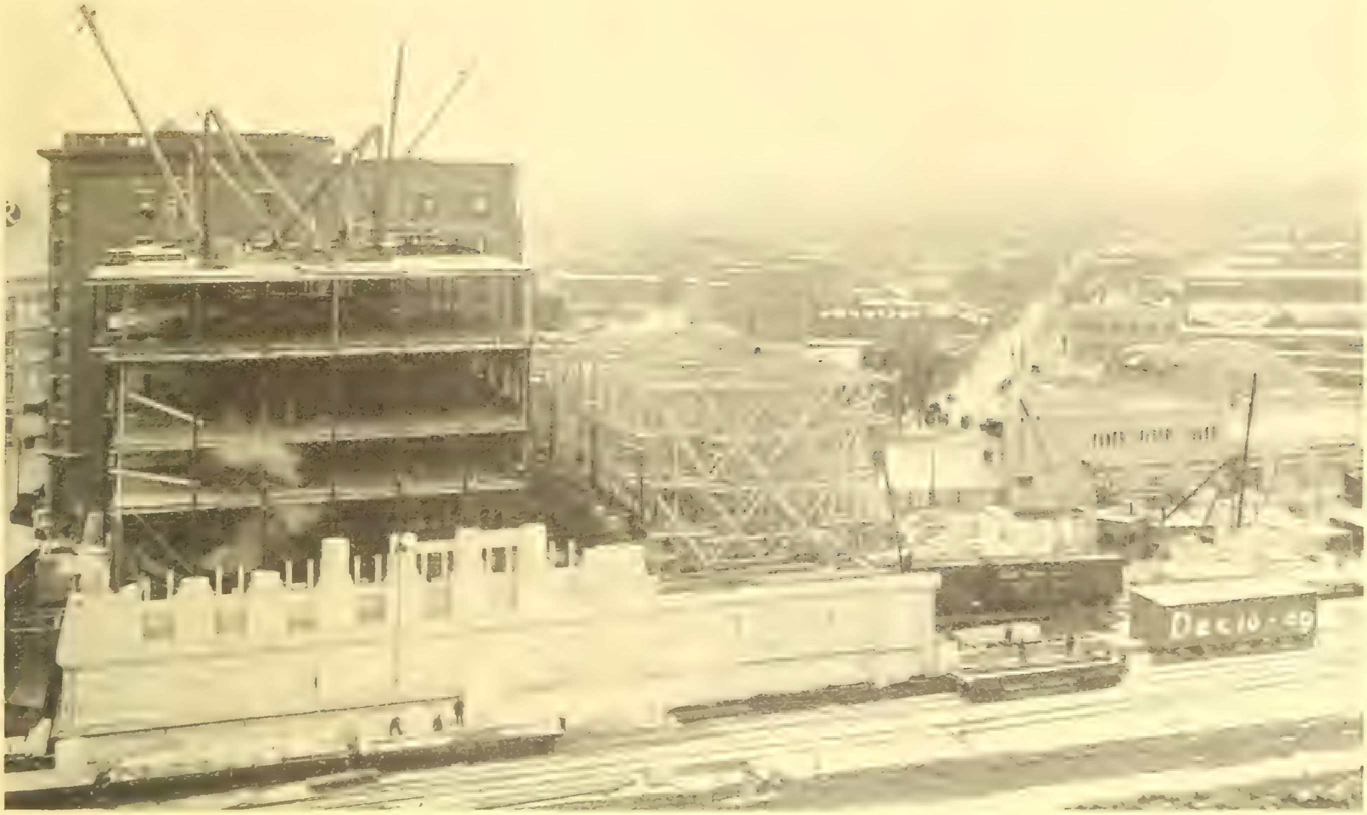
The next picture, fig. 2, shows the demolition of the old station completed and the debris removed. That portion of the site formerly covered by the old building is now being used as a stone cutting yard. The masonry has been carried up to the ground floor level on the west side, and the steel for the head house up to the fourth floor level. On the first and second floors the concrete floor slabs are completed. Form work is in course of erection on the third floor. Note the rock drills at work in the pipe trench. This trench runs through from the power house at the extreme south end of the baggage annex, (seen on right of picture), to the Chateau Laurier, situated in Major's Hill Park, across Rideau street and the Dufferin bridge. The pipe trench has a total length of about half a mile. Directly over the baggage annex will be seen a pile of rock, a portion of that excavated from the station site. The balance of the rock was crushed on the site and used in the concrete. Some of the stones in the base course were exceptionally heavy, weighing in some cases as much as 10½ tons. There are excellent facilities for the expeditious handling of material. By means of tracks extending into the building, the various supplies are deposited right at the base of operations. Underneath the main wall there is a track from which the cut stone is



(Fig. 2) 5th, November, 1909—Masonry in Progrees—Steel Carried up to Fourth Floor Level

Architects: Ross & MacFarlane

General Contractors: Peter Lyall & Sons, Montreal

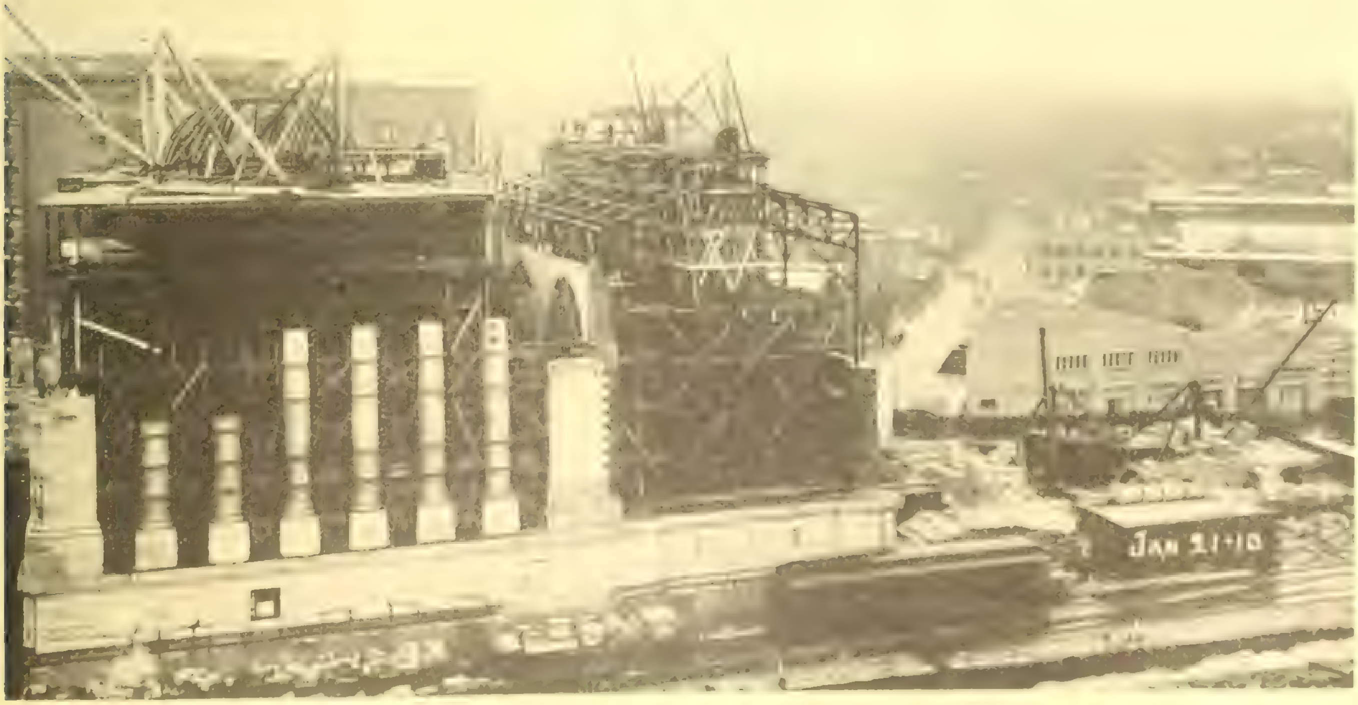


(Fig. 3) 10th December, 1909—Steel up to Roof Level—Concrete Floor Slabs Completed—Falsework for Waiting Room Under Way

lifted and placed directly in position, by means of a derrick erected on the uppermost tier of steel.

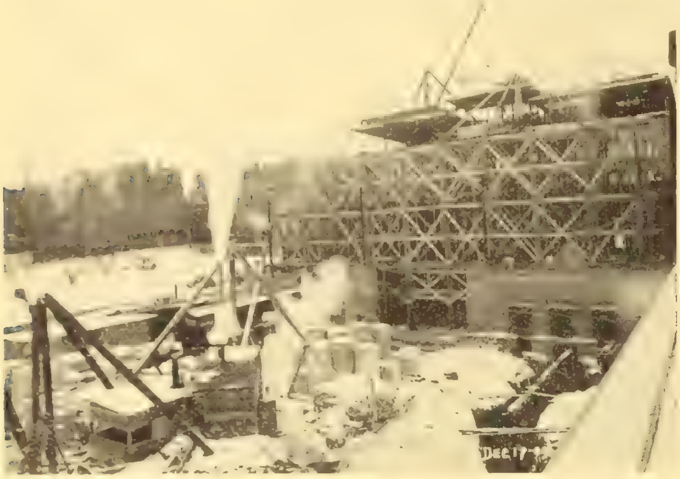
In the next picture, fig. 3, the steel is shown carried up to the roof level. All the concrete floor slabs are completed at this stage. The scaffolding for the waiting room is now partly constructed. This falsework is necessitated by the structure having a plaster barrelled vaulted ceiling, 70 feet in height. The masonry has been completed as far as the base course on the west side and front, and a portion of the columns set. The drums of these columns, it is interesting to note, weigh rather more than 8 tons.

The next photo, fig. 4, which was taken as recently as the 21st. ult., marks the final completion of the steel



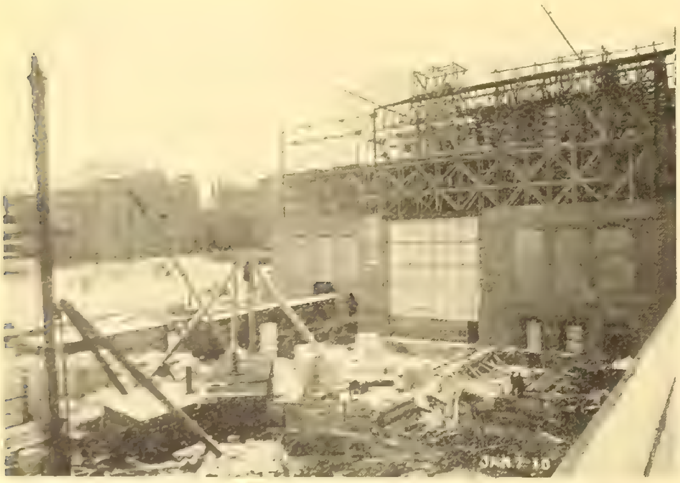
(Fig. 4) 21st January, 1910 Steelwork Completed Stone Masonry up to 3rd floor Main Scaffolding for Waiting Room Finished work, including the dome on the main building and over waiting room. The steel work represents about 700 tons. At this stage the finished stone masonry has advanced to the third floor, four of the columns being completed and ready for capitals. The main scaffolding for the waiting room is up and stone derricks are erected on top. On either side of the waiting room the mason work is carried up to the base course..

Figs. 5 and 6 are supplementary views taken from the south side and convey further ideas of the nature and progress of the work. In these pictures the south wall of the waiting room and the cut stone yards are in evidence. The main scaffolding is shown in course of erection, also the prosecution of work in the duct.



(Fig. 5) 17th December, 1909—South View of Construction on the New Depot, Showing Waiting Room and Cut Stone Yards

Equally as important as the ability to figure correctly on important works such as these and to obtain the contract at the right figure are the practical knowledge and experience required to handle every department of the work to the best advantage, and a competent, well-organized staff co-operating for the best results with good workmanship and economy. In these respects the G. T. R. projects at Ottawa are particularly well favored, and with a continuation of the present conditions their completion cannot but bring a full measure of satisfaction to all concerned.



(Fig. 6) 7th January, 1910—Continued Progress owing to Mild Winter

At a later date we hope to publish further views showing the final stages of the work. In the compilation of this data we are indebted to Mr. H. K. Ferguson, superintendent of construction for Messrs. Ross & MacFarlane.

Tests of Concrete Beams

The mechanical engineering department of the Massachusetts Institute of Technology is carrying on an investigation of the breaking strength and methods of failure of reinforced concrete beams of unusual proportions.

The form of beam which has been most frequently tested and regarding which the most information has been obtained in the past is what may be called the typical floor beam as it is used in the ordinary type of reinforced concrete building. The usual span of such a beam is about 16 feet and its depth from 18 to 20 inches

In engineering structures, however, the loads are often so great that it becomes necessary to use beams and girders of less than half the above length and twice their depth. With such proportions, engineers know very little about the nature of the stresses in reinforced concrete, and there is considerable doubt as to whether the beam acts like an ordinary type in deflecting or whether it supports its load in the manner that an arch does. A set of twelve specimens, 30 inches deep and varying in length from six to twelve feet, and a like set of just half the linear dimensions, have been furnished by the Ambursen Hydraulic Company. The results will be valuable, not only for themselves, but as showing the relative merits of small and large sized test specimens.

The laboratories contain machines capable of breaking columns up to one foot square by crushing, two beam machines, the larger of which applies and measures loads up to 100,000 pounds, and a 400,000 pound arch testing machine of special design, which is at present being used for beam tests.

The work of the department in concrete testing extends over a period of seven years, during which time there has always been some series of tests in progress.

One of the most interesting of the series was that in which reinforced concrete columns were subjected to fire conditions, the entire column being treated to a high temperature under load and then one side of it suddenly cooled by the application of a stream of water.

The beam tests, too, are not only valuable for the engineering data they afford, but are highly interesting to the contractor. The natural axis, or unstressed longitudinal section, of theoretical determination, and experimental data are necessary for the successful use of these beams in structures.

To obtain accurate and useful data of this kind, many tests must be made, and measurements of the most delicate character taken. The work includes, for instance, the measurement of the strain, elongation or compression of the beam at five or six points from top to bottom, when the load is applied, and at regular intervals for some time thereafter.

All tests made in the department are carefully tabulated, and many of the standard figures for the strength of materials which engineers use throughout the country were determined in this laboratory.

City Engineer Macallum, of Hamilton, Ont., will probably make application for the appointment of two additional engineers in his department during the busy season in prospect.

Chateau Laurier, Ottawa—At present about two-fifths of the steel-work is in place—This photograph was taken on January 21st, 1910

Erection of the Chateau Laurier

The Chateau Laurier and the new depot at Ottawa are twin projects of the G.T.R. The accompanying photographs give some idea of the work and rate of progress on the Chateau Laurier. The general contractors for this structure are the George A. Fuller Company, of New York. Sub-contracts have been awarded for the iron work to the Canada Foundry Company, and for the steel work to the Dominion Bridge Company. The architects are Messrs. Ross & MacFarlane, Montreal. At the time the larger view was taken, about 1,000 tons of steel had been erected. About 2,600 tons will be used in all.

Chateau Laurier—The scene of operations on Dec. 10th last

Cement Roughcast for Walls

The following is a specification clause for this work: All external surfaces of walls, except where otherwise shown on the drawings or described in this specification to be rendered with a coat of Portland cement and sand in the proportions of one of cement to two of clean sand. The rendering coat is to be at least ¾-inch thick. it is to have a rough surface, and before it is set a mixture of hot lime and fine washed shingle is to be evenly thrown on. The brickwork is to be thoroughly wetted, and the joints raked out before the rendering coat is applied.

It is absolutely necessary that, when carrying out this work, there shall not be the slightest chance of frost; for this would take hold of the hot lime, the shingle would shell off, and the whole be discolored and unsatisfactory, involving the renewal of everything, including the cement rendering. It is therefore better to leave any building ready for rough-casting late in the year to stand through the winter, and do this part of the work the following May or June.

The cement rendering to be left rough means that it is not to be trowelled, and it is advisable for the shingle to be dashed on by the same man or men, as changing the men about will tend to its uneven application. Small gravel is used, none larger than would pass a ½-inch ring, and, unless it is very clean, it should be carefully washed. It is mixed with the unslaked lime and water in a pail, and turned out fairly sloppy on a banker near the work or on the scaffold. A board held in the workman's hand shields window frames and such like, and the shingle is dashed on from a plasterer's trowel. The result is a creamy white, and is very pleasing, the rough surface of the pebbles breaking up the light. If a more creamy color is desired, it may be obtained by the addition of the requisite quantity, found by trial, of ochre or other dry pigment when mixing the dashing.

It need hardly be said that with the very greatest care a certain amount of splashing takes place upon adjoining woodwork, which should be then cleaned and have its final coat of paint after the rough-casting is finished.

Cement rough-casting without the hot lime has a very sombre appearance, but if such has been executed, and it is desired to finish it with appearance as above, there is no better method than to mix up a hot lime wash tinted as before mentioned, if so desired, and splash it on, not paint it on, with an ordinary whitewash brush.

Rough-casting of this description may be much improved by preparing cement screeds in imitation of half-timbering. These should be first marked out on the wall and put on in cement and sand, one to two, say, 6 inches wide and 1¼ inches thick, and when quite hard and set, intervening spaces filled in with the rough-cast cement coat and shingle. When setting out the half-timbering, remember what it is intended to represent and do not put the timbers in impossible positions. The cement screeds or "timbers" should be cleaned down and some time afterwards painted dark brown or black

Municipal Work at the Federal Capital

Description of the New Waterworks Aqueduct and Wellington Street Viaduct   Level Crossings Unpopular in the Federal Capital

The work now being carried on by the city of Ottawa for the purpose of enlarging its water supply affords several interesting examples of skilful engineering work. For its water supply the city is dependent entirely upon pumps operated by water power In the suburbs of Ottawa East and Hintonburg, which have recently been added to the city there are small plants operated, the former by electricity and the latter by steam, which have a capacity of 1,400,000 imperial gallons and 1,600,000 imperial gallons per 24 hours respectively. These plants are held in reserve in case of serious trouble at the main pumping station. A new acqueduct is now being constructed to convey the water from the Nepean Bay to the pumping house, which is to take the place of the old acqueduct, the capacity of which has been outgrown. In the main pumping house there is now installed machinery capable of pumping over 30,000,000 imperial gallons per 24 hours. On account of the growth of the city and also as a result of the construction of the new dam across the Ottawa river above the Chaudiere Falls, which will permanently raise the water levels in Nepean Bay, and thus make the work in the river section more difficult and costly, it was decided to estimate the cost of a new acqueduct and clear water pipe. The estimated cost of the new aqueduct is $227,700, and that of the clear water intake pipe, $89,500. The work consists of a cut through solid rock from Nepean Bay, in the Ottawa river, a distance of 2,500 feet to the pumping station, passing under the Canadian Pacific Railway yard, the Sawyer Massey storage building and Ottawa street. The aqueduct is covered and the various tracks, buildings and roadways are upheld by a concrete arch, 2 feet in thickness at the crown. The arch is reinforced by 1-inch square steel bars, spaced 6 inches centre to centre and No. 10 gauge 3-inch mesh expanded metal. There are two sets of stoplogs to control the water at the head, as well as a concrete valve pier to control the water in the intake pipe.

New Waterworks Aqueduct, Ottawa—Rock Excavation.

In the lower corner of the acqueduct the clear water pipe is being constructed of reinforced concrete. The pipe is 43 inches in diameter, and extends from the pumping station to the lower set of stoplogs. From there up and across the Ottawa river a 42-inch steel pipe of ⅜-inch metal is to be laid to the intake crib. The total length of the clear water pipe from the pump house to the intake crib is 5,500 feet.

A large quantity of rock is at present being removed from the bed of the river in order to lay the pipe. Flexible ball joints will be used where necessitated by the confirmation of the river bed. The work has been under way since September, 1907, and is about one-third complete. The new aqueduct under a 30-foot head, will provide 3,000 horse power. It is 27 feet in width with an average depth of 25 feet. The present aqueduct was built in 1873-74, and owing to the gradual expansion of the city, is too small to furnish power to operate the water works pumps. While the present 40-inch steel intake pipe will supply 16,000,000 imperial gallons every day with safety at low stages of water, that is at present the daily consumption of water.

Wellington Street Viaduct

In the matter of doing away with level crossings the city of Ottawa is well to the front. Wellington street, which is the main thoroughfare leading into the city of Ottawa, is crossed by four railway tracks within less than 1,000 feet, and is the main thoroughfare into the city from the west. The tracks were formerly protected by gates, but owing to teams being caught in between the various gates, accidents were frequent, and on the order of the Board of Railway Commissioners, a steel viaduct 522 feet in length, over the tracks has

Waterworks Aqueduct and Intake Pipe—Showing Concrete Retaining Walls, etc.

Waterworks Aqueduct—Construction under C. P. R. and Sawyer-Massey Building.

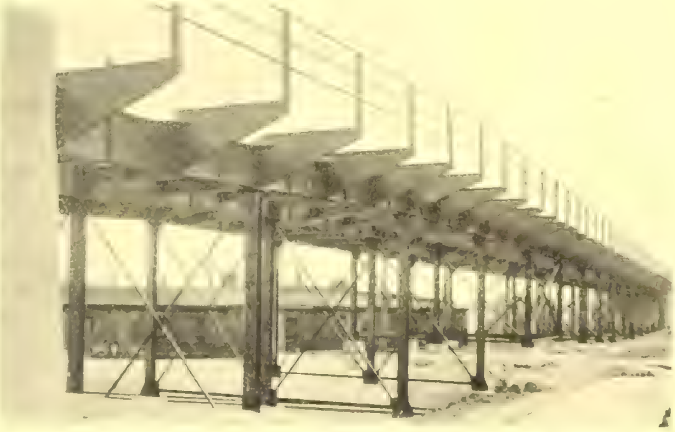
been constructed, while the approaches, which comprise masonry retaining walls with earth filling 565 feet in length, are near completion. The steel portion of the work was constructed by the C. P. R. The city built the retaining walls and approaches, as well as laying the creosote wood block paving on tarred plank foundation, and the sidewalks and metal railing. The width of the road is 30 feet, with 8-foot sidewalk on the south side, there being little or no pedestrian traffic on the north side. The cost of the work has been well within the estimate of $60,000. Land damages estimated at some $15,000, are still to be settled. The abutments and pedestals supporting the steel viaduct are all in concrete. The cost of the work was divided between the C. P. R., G. T. R., county of Carleton and city of Ottawa.

Mr. Newton J. Ker, city engineer, of Ottawa, is in charge of all the above-mentioned work.

Wellington Street Viaduct, Ottawa Retaining Wall and Abutment.

Distribution of Sewage in Percolating Filters

Very little definite information has hitherto been available as to the effect of distribution on filters by different methods, and particularly as to what takes place below the surface of the filter. On this subject we are again indebted to the experts in U.S.A. for details of the results of experiments. Mr. W. G. Taylor, M.Am.Soc.C.E., resident engineer at the sewage disposal works at Waterbury, Conn., contributes a paper to a recent number of the "Engineering Record," in which he shows by graphic diagrams the amount of lateral distribution which takes place below the surface of a filter as a result of the discharge on the surface of a single jet or drop of liquid. It was found that the liquids were more widely diffused in the fine material than in the coarse, and that the area of diffusion did not exceed a circle of 7 inches in diameter with 2-inch stone or 12 inches in diameter with ⅛-inch stone. These remarks apply to the discharge from a single fixed jet and they are qualified by a subsequent statement that the normal diffusion is restricted and often annihilated by the inter-action of the diffusion from adjacent jets which causes two or many liquid films to unite into minute streams, and these interrupt to a considerable degree the continuance of diffusion and tend to descend through the remaining material at a higher velocity and along lines of least resistance. Further, it was noticed that this streaming tendency increased as the rates of application were made greater. Among the conclusions the most important is that the desideratum in the application of sewage to percolating filters is to attain perfection in aerial distribution, and that a high efficiency in sub-surface distribution is fostered by a slow continuous rate of application rather than by an intermittent application at a higher rate. This last observation has an important bearing on the opinions of those who consider it desirable to use dosing apparatus on all filters, even when it is not required for the purely mechanical purpose of equalising the variations in the flow of the sewage.



Wellington Street Viaduct—Steel Structure.

Mr. Henry Beaumont, architectural sculptor, Montreal, Que., died last week in that city. He was born in [illegible] and was the son of Mr. W. M. Beaumont, a prominent contractor of Manchester, England.

The [illegible] Steel & Plate Company, [illegible], Ont., are reported to have assigned with liabilities of about [illegible]. It is expected that the assets will be quite equal to this sum. Efforts are being made to reorganize the company.

Methods and Cost of Concrete Pavement Construction

At the last annual meeting of the American Society of Municipal Improvements, Mr. J. B. Marcellus, City Engineer of Boise, Idaho, gave an account of concrete paving work which his city is carrying out on rather a large scale.

The city had had some previous experience with this type of pavement, as two years before the street commissioner had built a number of concrete sidewalks, and a year ago an alley had also been paved with concrete. The sidewalks had plain surfaces without marks or creases. The crosings were 6 inches to 8 inches thick, 5 feet wide, of a 1 : 8 river run mixture, and the top was smoothed off with a shovel. These crossings were built exceptionally high, and as a consequence they receive the thumping of everything that crosses them. These crossings show no mark or sign of wear at the present time. The alley was paved in a manner similar to the crossings, except that the concrete was placed in two layers, the bottom layer being a 1 : 10 mixture and the top a 1 : 7 mixture. This pavement also has shown no signs of wear. This year it was decided to lay 8½ blocks of concrete pavement on Front street. The street now being paved is parallel to the railway freight yards, where warehouses and the freight depot face the street, as also do the hay market and electric interurban freight depot. As a result, the traffic is slow, but heavy.

The width of pavement is 69½ feet, the reason for this being that on the south side no sidewalk or curb is required because teams drive directly up to the warehouses, and, the street car tracks being laid in the centre, the north sidewalk and curb are narrowed to 10½ feet.

The work is being done by contract and the usual bond for performance and quality of work was entered into, but no guarantee or maintenance agreement was required. The bidder, however, is to protect the city against any claims for infringement of any patented article, invention, arrangement or appurtenance that may be used in connection with this work. The work at the present time is about half completed. The subgrade so far has been good. All of it is being rolled thoroughly with a 16-ton roller. The specifications require all spongy places to be refilled with sand.

All tests of the cement are made by the standard method of the American Society for Testing Materials. A good quality of river sand is being used, very clean, although a little fine, and having 30 per cent. of voids as determined by a number of tests. The gravel is excellent. It consists of crushed granite boulders up to 6 inches in diameter, porphyry, rhyolite and various other forms of river wash in a mountainous country. These are screened through a 2½-inch mesh screen and grade up well in size. The gravel is obtained from the bed of the Boise river, and is all passed through a jaw crusher to crush the oversize, but, as in all jaw crushers, "flats" or "pumpkin seeds" over 2½ inches in longest diameter will come through. These are easily broken with a 7-pound hammer, and one man, working only a part of the time, keeps most of the pumpkin seeds broken. A number of tests shows the gravel to contain about 40 per cent. of voids.

These materials are mixed in the proportion of 1 : 3 : 7, and give a concrete that fills well and which, after thorough tamping, can be smoothed off with a wooden float. No topping or special mixture is required for the top, the specifications requiring only a uniform surface with no stones larger than ½-inch in diameter to show. Sometimes a mixture of sand and cement is used to level up with if the concrete does not tamp down level, or an unusual number of large stones appear on the surface. The final thickness of the pavement is 8 inches. Two mixers are being used, one run by a gasoline engine and the other by a motor, at a cost of $22 per month, including moving of connections. Both mixers are small size, but turn out from 30 to 40 cubic yards per day.

Expansion joints of ½-inch are provided at the curbing and at every 25 feet at right angles to centre line of street. These joints are to be filled with paving pitch. At present they are filled with ½-inch dressed boards. After the concrete is set sufficiently it is covered with 2 inches of dirt and kept wet for seven days.

The bil accepted by the Board of Public Works was as follows:

Concrete	per cu. yd.	$5.29
Excavation	"	.48
Excavation below subgrade	"	.55
Refill below subgrade	"	.85

The gravel and sand cost 80 cents per cubic yard delivered. The cement costs about $2.75 per barrel f.o.b Boise. Labor is $2.50 for eight hours, and teams $5, although the contractor has sublet the hauling of the gravel and sand at 60 cents per cubic yard. At the contract prices the cost of the pavement will be about $1.51 per square yard. The other pavements have cost $2.50 per square yard and upward, so with this difference in price the city can afford to do considerable maintenance.

Each year the Canadian Society of Civil Engineers offers for competition among its student members a number of prizes for the best papers on subjects in any department of engineering. In 1909 all the prizes awarded were taken by students of McGill University, Montreal. Only two were awarded this year, the first being won by Mr. E. S. Heurtley, a student in the Faculty of Applied Science, for a paper entitled "Discussion on One of the Problems of Submarine Cable Telegraphy," and the other by Mr. A. S. C. Trench, a third year student in Applied Science, for a paper entitled "Some Consideration on the Theories Governing Elastic, the Breakdown of Members Subjected to a Compound System of Stresses." In addition to these prizes, the Gzowski Medal was awarded to Ernest Brown, M.Sc., associate professor of Applied Mechanics in McGill, for his paper on "Tests of Reinforced Concrete Beams."

On the National Transcontinental, the G.T.P. east of Winnipeg, 623 miles were added during 1909. The Canadian Pacific built 395 miles, and the Canadian Northern, 344 miles. On the western section, the Grand Trunk Pacific has work under way on 438 miles, and surveys have been made for 516 miles additional. East from Winnipeg, Man., work is under way on 1,244 miles. The Canadian Pacific and the Canadian Northern also have a large amount of work projected or under way.

The city of Edmonton, Alta., is facing the best building season in its history. Practically all the trade unions are signed up on agreements covering three years—the carpenters are signed up until 1912; bricklayers until 1912, and laborers until 1914. A total of nearly $1,000,000, in three-storey buildings alone, is in sight for the season. Several larger buildings will also be erected.

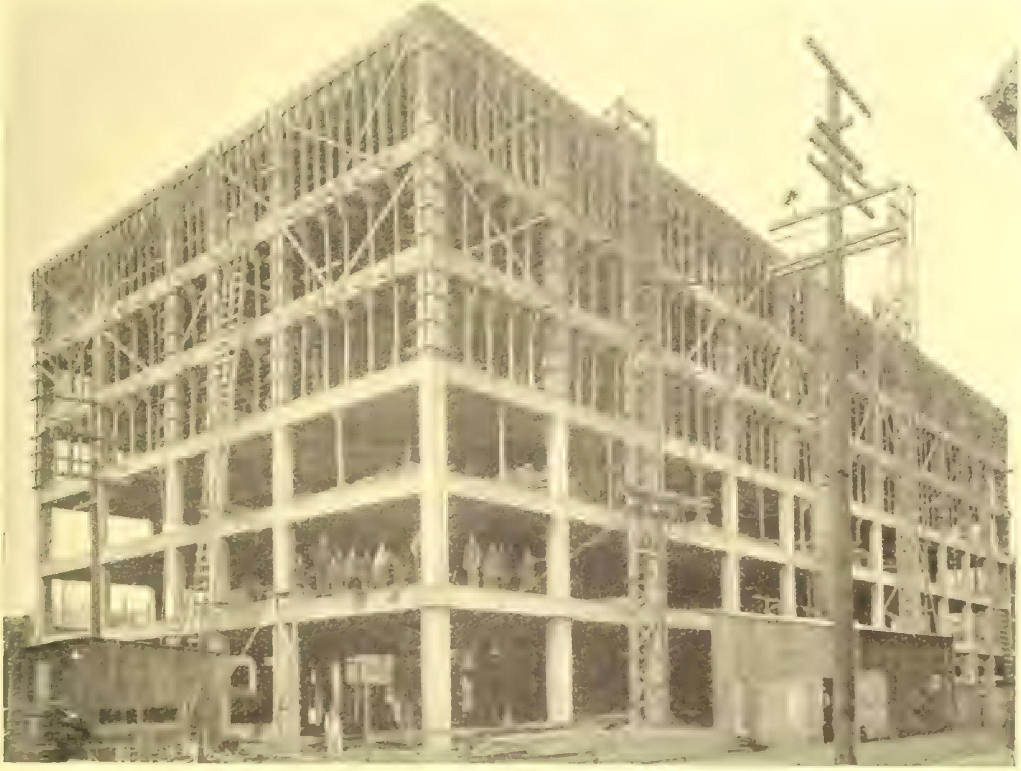
The New Pemberton Block, Victoria, B.C.

A Sample of the Modern and Substantial Buildings now being erected in Western Canada—Interesting Details of Construction

The accompanying illustration conveys some idea of the up-to-date methods employed in the construction of the new Pemberton block, at Victoria, B.C. The structure will occupy an area of 88 feet on Fort street, 188 feet on Broad street and 88 feet on Broughon. It will have basement and six storeys and will occupy 107,575 square feet of floor space. The accommodation provides for 11 stores and 170 offices, 40 of which contain large fire and burglar proof vaults. The top floor and part of the fifth will be used solely for the purpose of the Pacific Club. Three elevators are installed in the building which is accessible by two entrances. The substantial construction of this building is a noteworthy feature. The Kahn system of trussed steel and concrete is employed. In this, at the time of writing, 250 tons of steel have been used, 3,700 yards of rock, 1,700 yards of sand and 20,400 sacks of cement. In the construction of the forms, 600,000 feet of lumber have been employed. The excavation for the basement was 12,000 yards.

An interesting test was made of the strength of the building. On a space 19 feet square, were piled 21,707 bricks, giving a total weight of 108,535 pounds, a load of 300 pounds to the square foot. A further test was made by covering another area of the same size with sand to a depth of six feet, giving a load of 550 pounds to the square foot. On the first test there was a deflection of 1-32 of an inch, and on the second a deflection of less than 1-4 of an inch. Columns were also tested by being subjected to a load of 60 tons. Under it there was not the least indication of settlement.

The owners, Messrs. Pemberton & Son, will be provided wtih spacious offices on the ground floor on the corner of Fort street and Broad street, in which there will be two specially constructed safety deposit vaults constructed of reinforced concrete and brick. The building is being erected according to the design and under the superintendence of Messrs. George C. Mesher & Company, architects, Victoria, B.C.



The Pemberton Block, Victoria, B. C., now in course of construction.

Mr. C. H. Topp, the retiring city engineer of Victoria, B.C., was recently presented by his staff with a Prussian leather Morris chair and an illuminated address. The latter, which was engrossed by Mr. R. C. Flitton, was quite a work of art. The border included reproductions of the Point Ellice bridge and the Causeway, the two public works which began and ended Mr. Topp's connection with the city which extended over eleven years.

Acting City Engineer Latournell, of Edmonton, has been permanently appointed to the position

Selecting a Scheme of Sewage Treatment

Principal Factors Outlined by an English Expert—Facilities for Disposal an Important Consideration—The Question of Management

At the annual meeting of the Managers of Sewage Disposal Works (Eng.), Mr. Sidney R. Lowcock, M.I.C.E., contributed a paper on the above subject. Among the factors to be taken into consideration, the author laid down the following:—What was the population producing the sewage and what were their habits and occupations; what was the probable increase in the population to be provided for by the scheme during the period over which the money for its construction could be borrowed; how many baths and w.c.'s there were, or were likely to be in the district, the quantity and quality of the water supply; was there any considerable amount of laundry work done in the district; what proportion did the maximum and minimum rates of flow of the dry weather sewage bear to the average rate of flow, and at what hours did those rates of flow occur; were the works close to the contributing area and was the area hilly or flat; was the sewage brought to the works by simple gravitation or through any parts of the system by inverted siphons in which at periods of minimum flow it became more or less stagnant, or was it pumped; what was the condition of the sewers with reference to subsoil water; was the sewerage of the district on the separate, partially separate, or combined systems; if rain water was admitted to the sewers, did storm water overflows exist?

It was also important to ascertain whether manufacturing waste was admitted to the sewers and if so what was its nature; what proportion it bore to the whole dry weather flow of sewage; whether it was treated at all by the manufacturers, and whether it was discharged at a uniform rate or intermittently. The answers to these questions would probably decide as to whether chemical treatment would be necessary, and also as to the necessity or otherwise of providing equalizing tanks at the works. Then they had to decide how much treatment was necessary, and this depended on the ultimate destination of the effluent. Was it to be passed into the sea or tidal waters, into a large river, a lake, or into a small inland stream, and what was the condition of the water in the river or stream at the point where the effluent was to be turned in, and for what subsequent purposes was such water used? Whatever scheme was adopted the sewage would be screened on entering the works, unless it had been pumped, when, of course, the screens would be at the pumping station, and then passed through detritus tanks. The fall available through the works did not affect these except in so far as emptying was concerned, but for the subsequent treatment it was an important factor.

Discussing the land factors involved, the author said they included the available area and the nature of the surface and subsoil and the question of fall. Broad irrigation demanded a large area of suitable surface with a small fall, while intermittent downward filtration required a suitable surface and subsoil and a fall slightly in excess of the depth to which the land was drained, and in either case the site must not be liable to be flooded by river water. If artificial filters or contact beds were adopted the area available became of less importance and the fall was the dominating factor. If percolating filters were to be used the fall available must be somewhat in excess of the total depths of the filters, the excess depending on the type of distributor adopted. Where the distribution was by means of surface channels the extra fall required was very small, but the distribution was very bad. With dripping distributors the fall must be somewhat greater. With rotary distributors of a moderate size the head required to work them was about 12 inches for each set of filters, travelling distributors on rectangular filters required about 27 inches head, and fixed spray distributors about 42 inches. If distributors were to be used intermittently the depth of the storage provided for in the dosing tank must be added. The nature of the sewage and the kind and efficiency of the preliminary tank treatment and also the proximity or otherwise of dwellings, factories or roads to the works were factors influencing the type of distribution which could be adopted. The nature of the sewage and the quality of the tank effluent also governed the size of the material to be used in the filters, and in some cases rendered desirable the combination of contact beds with percolating filters or land, or the combination of all three.

The available fall was also a factor in deciding whether humus tanks, sand filters or land could be used as a final treatment after the main filters or contact beds. A factor which very frequently received very little or no consideration at all until the works were in operation and serious nuisance arose was as to the facilities that existed for dealing with and disposing of the sludge. Would the works be in an agricultural district and could they induce farmers to take and dispose of it, or would they have to trench it into the ground, or press it and send it away, or disintegrate it and mix it with refuse and burn it, or dispose of it in some other way? There was also the question of what kind of sludge they would get.

The last and one of the most important factors of all, and one which would appeal to the members of the Association was—what was the supervision and management going to be like when the works were completed? A poorly selected and designed scheme might be made to work somehow by good management, but the most carefully and best designed could be easily ruined by bad management.

Mr. R. McKay Fripp, architect, Vancouver, B.C., recently gave an illustrated lecture in that city under the auspices of the Art, Historical and Scientific Association. His subject was "Architecture, Ancient and Modern." Mr. Fripp dealt with architecture from the earliest history down to the present time. The Egyptian, Grecian and Roman styles were described and the principal features of each described, as well as the origin of some of the leading points. The speaker passed on through the changes and renaissances to the present time and showed the debt of modern architecture to the builders of the past. The lecture was illustrated by a number of interesting slides.

Mr. R. S. Kelsch, Montreal, has been appointed consulting engineer for the Quebec Railway, Light & Power Company.

Trade News from Montreal

Architects a month late on their work—But the Building Trades losing no time—Better Outlook for Civic Contracts

Office of the "Contract Record."
Montreal, February 7th, 1910.

The ordinary quiet mid-winter tone pervades the building supply market in Montreal.

Cement is quoted at from $1.65 to $1.75, in small quantities, while the wholesale price remains at $1.40 per bag f.o.b. cars Montreal. There is practically no movement in cement, and dealers are called upon to fill only small orders The prices for 1910 delivery are expected to remain at the present figure.

Bricks are not in heavy demand. No. 1 reds, pressed, are worth $18.50 per M., and red and buff flash bricks are quoted at $20 per M. Scotch fire bricks remain unchanged at $23, and English fire bricks are quoted at $20 to $21 per M., with the ordinary winter demand

Dealers make the complaint that architects are more than a month behind on their plans, as compared to a year ago, which means that building operations will be delayed in the fall. Here and there contractors have proceeded steadily with exterior construction work and they have been greatly assisted by the frequent mild spells of weather which have characterized our winter to date.

The joint contractors on the new Windsor street station foundations, have worked continually day and night and as a result have their contract well in hand. The exterior work on the Banque Nationale has been practically completed by the contractors, Messrs. J. B. Pauze & Company, and presents a fine appearance.

The erection of an eight storey building at the corner of St. Gabriel and St. Paul street for Messrs. Duchesneau & Duchesneau, was commenced the last week in December and excellent progress has been made. The building is a reinforced concrete structure with steel frame, and has been rapidly pushed forward by the various contractors. Mr. Joseph Faille has the contract for the stone and brick work; and E. D. Hofeller has the contract for the reinforced concrete work. The Riebling Construction Company had the contract for the fireproofing, while the Dominion Bridge Company supplied and erected the steel work. The building is fireproof throughout, and was designed by Mr. C. D. Dufort, architect, La Patrie Building. It is faced with Roman stone and Milton buffed brick, supplied by T. A. Morrison & Company.

Superintendent Janin, of the Waterworks Department, states that satisfactory progress is being made on the widening of the aqueduct by the contractors, Messrs. Quinlan & Robertson. The cofferdam was completed about two months ago, and a portion of the aqueduct drained. The contractors have one steam shovel at work and have excavated about 25,000 yards of earth. They expect to place an additional shovel in operation shortly.

January Building Figures

The figures from the Building Inspector's office for the first month of the year are very encouraging. Seventy-three permits were issued for construction of buildings or alterations, the registered cost totalling in round numbers $160,000. In the same period of the previous year 50 permits were taken out, and their value reached $120,000, showing an increase of 33 per cent. for January, 1910.

Montreal Speaks Plainly

The result of the recent civic elections in Montreal is being received with general satisfaction. The searching investigation of the Royal Commission, completed a short time ago, revealed a condition of maladministration of the city's public works almost incredible, and the sweeping victory of the reform element, headed by the Citizens' Committee, came as an emphatic expression of the citizens' disapproval of such unfaithfulness to public trust.

The new council is composed almost to a man of the choice of the Citizens' Committee, and the famous "23" have been ousted completely. The corrupt dealings of this section of the late council known as the "23," uncovered by the Royal Commission, are perhaps without a parallel in municipal administration. Contracts were unscrupulously let to the various friends of the clique and little regard was paid to the methods of carrying out of these same contracts. To the highest tenderer frequently fell the richest plums. In the construction of public buildings, ordinary building practice was but loosely, if at all, considered. Specifications were not adhered to, and the work was performed in a manner that enabled the grafters to fatten at the expense of the city. The amount of money illegally taken every year by these men from the city treasury was estimated by Judge Cannon in his report at $1,250,000.

As a monument to the character of work that was carried through under the old regime may be pointed out our No. "13" fire station, a structure that, when completed, hardly complied in any respect with the architect's specifications.

Speaking to the "Contract Record," Mr. Peter Lyall, a prominent worker in the citizens' reform movement, said: "The election has been a great victory and our citizens have responded more heartily than even the most sanguine hoped. The men elected are all good business men and honest citizens, and in their hands I feel that the affairs of the city will be safe. Their efforts for a time will be handicapped. The appropriations for the coming year have practically been arranged for by the outgoing council, but in time a great change will be effected. Proprietors," continued Mr. Lyall, "will reap the largest benefit, but in the general improvement in municipal government, contractors will find their place."

In the future, contractors will be able to submit their tenders on municipal work with the reasonable certainty that they will receive every consideration without the necessity of "buying off" the favor of a member or members of the various committees. Under the old methods, such as have been mentioned, an honest contractor did not feel that there were any inducements for him to tender on the city's contracts. In the future, all transactions will be conducted up and above board and the contractor will have a fair field and no favor. He will find that specifications must be rigidly adhered to, and he will also enter a field where the competition will be keen, but above reproach.

It must not be inferred that every department in the city hall was involved in the recent investigation, for this is far from being the case. There are certain departments in that institution that, in spite of their unhealthy surroundings, have been operated by careful competent officials who have successfully guarded the citizens' interests.

Glancing through the work of the survey department we obtain the following interesting figures concerning the operation of that section of the city's civic work: From 1905 to 1908 this department, under the direction of Mr. Stuart [illegible], laid in all 11,240 lineal yards of sewers. For the carrying out of this work, $948,400 was appropriated by the council, but the work was completed at a cost of $827,000, shewing a gain to the city of $121,400. These sewers were completed partly by day labor and partly by contract, and it is interesting to note that in almost every instance the sewers constructed by contract were completed below the engineer's estimated cost of construction.

Our Winnipeg Letter

Office of the "Contract Record."
Winnipeg, Man., Feb. 4th.

Spring work is rapidly opening out and the many plans matured call for an early start—as soon as weather conditions permit. Indications are stronger than ever that the building and contracting lines will have a big year.

Many contractors fear either a shortage of building supplies, or labor, but we believe Eastern Canada and the States can readily fill up any wants we may lack in the West.

Up to the first of the month there was not much building, consequently very little movement in lumber or other material. Whilst the stocks are up to the average, they are not large. Wholesale travellers are just beginning to get out and supply men are ready to buy.

The outlook for the building trade is brighter than ever. There are almost numberless towns in which there is a dearth of houses, and these houses, owing to the urgent demand, will be built the coming season. In these towns the population is ahead of the housing capacity—a condition that speaks highly for the prospective retail trade, as with scores of houses unoccupied the lumberman knows that population must increase before there can be a lively demand for building material in the residential line.

In the older agricultural districts the farmers have not kept pace with their wealth in building, but the newer settlements have done much better.

In many towns the bulk of building has been for large jobs—court houses, school houses, churches, store buildings, public halls and the like—a class of work in which, as a rule, there is small profit to the local builder. In many instances the work is done by outside contractors, and in this case the competition is so sharp that a reasonable profit to the man who sells the building material is rarely expected.

The outlook is very bright and we are on the eve of pronounced prosperity. Our estimate for the year's work in and around Winnipeg is over $15,000,000 in construction work. In fact, we have prepared a list of over $20,000,000 worth of proposed and prospected work in Winnipeg alone.

Forecast of Building Inspector Rogers

More men are working on construction at the present time in Winnipeg than in any previous year in the mid-winter season. This is the statement of Building Inspector Rodgers. Building operations went on steadily all through January. The permits granted last month were much more numerous than those issued in January, 1906, the banner building year in Winnipeg's annals. However, the total value of the permits issued in January, 1906, was slightly greater than the value of the permits issued last month, the respective totals being $203,650 and $180,900.

"It looks like the biggest building year Winnipeg has ever had," states Mr. Rodgers. "January passed expectations and would easily have beaten January, 1906, but for the fact that I had to turn down several applications for tenements which did not comply with the new by-law. These will come in next month, and the rush will get under way in March."

An Expensive Bit of Folly

A quarrel between two employees of the Winnipeg city asphalting plant, which took place in the year 1900, has since cost the city approximately $60,000 to straighten out. This has been for repairs on work improperly done at that time. In the year 1900, there was a quarrel between the foreman in charge of the asphalt plant and the man who was in charge of the street gang. In order to discredit the man who was looking after the laying of the material in the streets, the man in charge at the plant overheated the asphalt to such an extent as to destroy its adhesive qualities. The result has been that the pavement will not wear properly, and each year the city has been put to a heavy bill of expense for repairs. The surfacing material would crumble under the impact of the shoes of horses, and would then wash or be swept off, leaving nothing but the binding coat or concrete base. Thousands of square yards of asphalt have been relaid, and there is still a considerable area to be looked after.

Engineer of Construction Astley presented a recommendation to the board regarding repairs to asphalt. He pointed out that wherever any defect in the roadway, due to the sinking of the curb or sub-base of the roadway was discovered, it was most economical to attend to the repairs at once, rather than wait till trouble developed. Frequently the washing away of the earth from beneath the curb had caused a considerable sinking, in which the concrete road base had been broken off.

Mr. M. J. Butler's Successor

Mr. A. W. Campbell, Deputy Minister of Public Works for the Province of Ontario, has been appointed to the position of Deputy Minister of the Department of Railways and Canals to fill the vacancy caused by the resignation of Mr. M. J. Butler. The new deputy minister will assume his duties on February 5th. Mr. Butler will continue for a short time in an advisory capacity. Mr. Campbell will also be chairman of the Board of Management of the Intercolonial Railway. The salary he will receive will be the same as that of other deputy ministers, namely, $5,000. No appointment has yet been made to the position of Chief Engineer of the Department of Public Works, which Mr. Butler also filled. A biographical sketch of Mr. A. W. Campbell appeared in our issue of January 19th.

The steel work on the legislative wing of the new Parliament Buildings at Edmonton, Alta., has just been completed. During the past few weeks the steel construction gang has been rushing the beams into place, with the result that the skeleton of the entire building is now almost completed. The last beam on the dome of the legislative wing was placed in position ten days ago. It is the expectation that this wing will be completed in time for occupation by the Provincial Legislature in January of next year.

Ottawa Exchange Doing Excellent Work

The Ottawa Builders' Exchange held their second annual meeting on Jan. 27th, in their rooms at 201 Sparks street. It was a very successful and enthusiastic meeting, and was well attended. Various matters pertaining to the building trade, and to the city generally, were referred to in the report of the directors and by the president in his address. The past season having been such a busy one for the builders, contractors and supply men, a lively interest prevailed. The directors were pleased to report the absence of strike or labor troubles during the year just ended. The Uniform Form of Contract, which was framed last season for general use in the city, has been put in printed form, and is receiving the attention of the builders and architects.

Mr. George A. Crain, who was re-elected President of the Ottawa Exchange.

The election of officers for the ensuing year resulted as follows: President, Geo. A. Crain (re-elected); 1st Vice-President, August Boehmer; 2nd Vice-President, J. Thorpe Blyth (re-elected); Treasurer, James Ritchie. The directors will elect their secretary at their first meeting.

The annual meeting of the Canadian National Association of Builders, which will be held in London, Ont., on the 8th and 9th prox., will be attended by the following representatives of the Ottawa Exchange: Geo. A. Crain, president of the Association; T. D. MacFarlane, director for the Ottawa Builders' Exchange; August Boehmer, Hugh Bell, W. G. [illegible] and [illegible] Kenzie, secretary.

The second annual meeting of the Builders' and Contractors' Association of Essex, held in Windsor, Ont., on Feb. 1st, disclosed, generally, a most satisfactory state of affairs. The Association is doing good work in this section of the country and is developing in a most gratifying manner. Regular meetings are held on the first and third Tuesdays of each month, and much interest is taken in the work. The election of officers resulted as follows: President, L. B. West; Vice-President, U. J. Doumachille; Financial Secretary, Geo. C. Haugh; Recording Secretary, Geo. W. Freeman; Treasurer, Robt. Parker. The executive board is composed of these officers with the addition of Messrs. [illegible] Padden and A. A. Little.

Canadian City Engineers

Mr. T. Harry Jones, Brantford, Ont.

The subject of this sketch is an old Brantford boy, having been born in that city in the year 1856. In 1853, when the County of Brant was divided from the Gore district, his father, Stephen James Jones, was appointed judge of the county, holding that position for over 40 years.

Mr. Jones graduated in civil engineering at McGill University in 1877. Among his classmates at that time were Messrs. P. D. Ross, R. B. Rogers, Willis Chipman and the late W. McLea Walbank.

In 1878, Mr. Jones was admitted to practice as a Provincial and Dominion Land Surveyor. In 1880 he formed a partnership with F. H. Lynch-Staunton, of Hamilton, and for two years was engaged in Government surveys in the Northwest. In 1883 he began the practice of surveying and engineering in the city of Brantford, acting as city engineer, and as engineer for several townships in the County of Brant. In 1893 he was appointed City Engineer of the city of Brantford, which position he still fills.

As City Engineer, Mr. Jones had charge of the construction and extension of the Brantford waterworks and sewerage systems. Some 12 years ago, Mr. Jones designed and constructed extensive flood prevention works in the city of Brantford, including the widening and deepening of the river channel, the lengthening of the bridges, the construction of a sluiceway dam, and the building of about three miles of dykes. Mr. M. J. Butler, C.M.G., the retiring Deputy Minister and Chief Engineer of Railways and Canals, was the consulting engineer on this work.

Mr. T. Harry Jones, B. A. Sc., Mem. Can. Soc. C.E., City Engineer of Brantford, Ont.

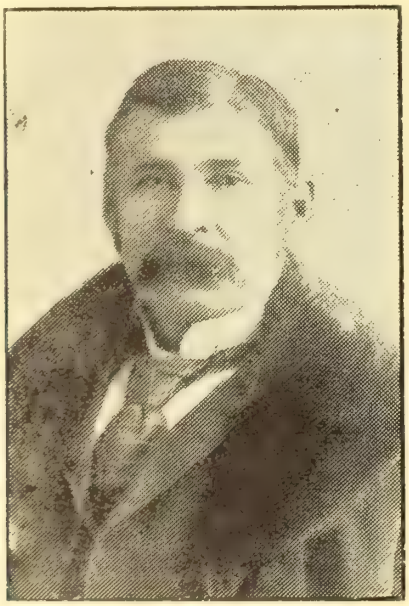
The work in the City Engineer's department last year amounted to $230,000. During the past two years the city has expended [illegible] on constructing new sewers. For the past 20 years the city has constructed its sewers and concrete sidewalks by day labor, and at the present time [illegible] lower rate than they have been able to secure by tender. (This should provide some of our contracting friends with food for reflection.)

Mr. Jones has been engaged as engineer in arbitrations for the corporations of Brockville, Peterborough, Guelph and Stratford, and by the Ontario Government as commissioner for the purpose of making a survey of Burlington Beach and the adjustment of the respective rights of the settlers and the city of Hamilton. He is a member of the Canadian Society of Civil Engineers and one of the charter members and past presidents of the Association of Ontario Land Surveyors.

That the City Engineer of Brantford is imbued with the military spirit is not surprising, his grandfather having fought at Queenston Heights and his father having been adjutant in the Gore Militia. While at McGill, Mr. Jones was a member of the University Company of the Prince of Wales' Rifles. In 1883 he took a three months' course in the military school at London, Ont., there obtaining a first class certificate. He joined the Dufferin Rifles of Canada during the same year, and rose to the rank of senior major in that battalion, retiring in 1894 with this rank. On the organization of the Corps of Guides, Mr. Jones was appointed Sub-District Intelligence Officer, serving for five years in that corps with the rank of captain.

Sixty Years an Architect

Mr. F. X. Berlinguet, who, by reason of his extended association with the architectural profession, was the guest of honor at the banquet held in connection with the Nineteenth Annual Convention of the P.Q.A.A., was born in 1830, and was a son of Thos. Berlinguet, an architect and sculptor. He served his apprenticeship under his father, in collaboration with whom he designed many fine churches and public buildings. On the occasion of the visit of H.R.H. the Prince of Wales, in 1860, he received a prize and medal for a wooden statue prepared for the Church of Beauport. In 1869 he obtained the contract for the construction of four divisions of the I.C.R., a distance of eighty miles, the largest contract given in this undertaking.



Mr. F. X. Berlinguet, the Father of the Architectural Profession in Canada.

In 1874 his plans for the Quebec harbor attracted much notice. Mr. Berlinguet afterwards served in the capacity of executive architect for the Federal Government and as official arbitrator for the province of Quebec. In 1880 he prepared plans for the Hotel Dieu at St. Basil, N.B. Later on he was awarded second prize for a plan for the Provincial Parliament Buildings at Toronto. In 1881 he submitted designs for the new Quebec bridge. In 1890 he was one of the promoters of the A.A P.Q. It is interesting to note that Mr. Berlinguet was one of the first men connected with the construction of the Quebec bridge. In 1896 he associated himself with Mr. R. P. Lemay and continued with him for seven years.

In spite of his four score years, Mr. Berlinguet still takes an active interest in the work of the profession. At the banquet recently held in his honor, he expressed himself deeply sensible of the honor paid him and appeared to be much moved by the demonstration of his younger confreres.

Principles of Plumbing Ventilation

Nature makes a wonderful provision for creating a constant circulation of the air, which is natural ventilation. To this, plumbing supplies a number of important aids, by the adoption of which one is enabled to materially guard against the evils which flow from the lack of proper ventilation. Plumbing ventilation is that part of the general drainage system whose duty is to carry off to the outer atmosphere any gases of putrefaction formed or confined within the system, to prevent back pressure, or vacuum on the trap seals, or the entrance of sewer air into the building, says "Shoppell's."

Many scientific examinations of the air found in sewers has established the fact that no distinct gas which can be properly called "sewer gas" exists. The gases found in sewers vary with the quality of the matter confined within them and fermenting. The most dangerous of these gases is sulphuretted hydrogen, which is a product of the putrefaction of organic substance containing sulphur, and is one of the causes of the sickening odor of drains. Its gaseous state is not permanent.

Although a drainage system is usually open to the atmosphere it may not always follow that the normal pressure of the atmosphere is maintained. When fluids are in motion, or the flooding of a sewer causes back resistance, the pressure in the various parts of the system will vary. Any part of a system subject to pressure greater than the atmosphere is called a plenum, and any part subject to a pressure less than that of the atmosphere is called a vacuum. In house ventilation it is quite as necessary to secure thorough distribution of fresh air as to provide an outlet and inlet, and foul air should be well mixed with that which is pure. Three general results follow the changes in atmospheric pressure, the increase in the draft of the chimney, a back draft, or the reversal of currents, and the increase of evaporation, all of which are a menace to health. It is to obviate these that plumbing ventilation is resorted to.

In plumbing ventilation there are two methods of producing circulation of the air, called the natural and the forced draft systems. The natural method is caused by the difference of temperature between inlet and outlet, and the currents move at very moderate velocities. The forced draft method is placed in operation by mechanical means, and any direction or required velocity

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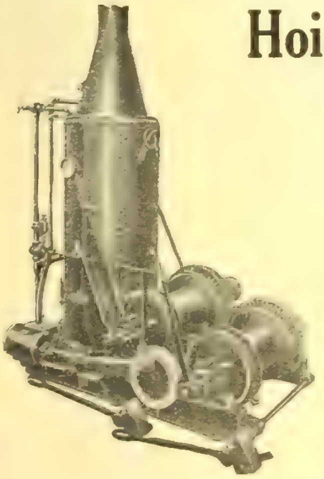

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can be obtained for the currents. Heat is the great moving power of air, and the heat from the fireplace or heater is utilized. Usually a chimney is used for the flue, and its construction is of great importance. It should be smooth, preferably of vitrified pipe, circular and of the same diameter throughout its entire length. A separate flue made of vitrified pipe, should be used for seat or local ventilation, as its interior is smooth and frictional resistance is less than when laid with brick or square flues. Even when no fire is burning, a chimney plays an important part in ventilation, as the air in an inhabited building is usually warmer than that outside, and it will generally be found that an upward current is moving.

With drainage ventilation, the object is to prevent the foul sewer air from entering the building through traps, by preventing back pressure and deodorizing the drain currents by allowing fresh air to flow through the entire system. One system is to disconnect the sewer from the building by inserting a trap on the main drain, with an inlet pipe near it opening to the outer air near the ground level. This will allow the heavier, or cooler air, to enter and crowd out the lighter, producing a continuous inward and upward air current, and deodorizing the entire pipe system. Another method provides the intercepting trap, but takes the fresh air from near the eaves, or below the outlet of the soil pipe extension, and well away from windows, skylights or ventilating shafts. The natural method emits the trap on the house drain, allowing the current of warm air to rise from the sewer and discharge above the building.

"A new arrival Your Majesty, who says he was a building contractor on earth."

"Ha! ha! Put him in one of the cells marked 'absolutely fireproof' and let it burn slowly."

Foul drain air will not always flow in the same direction, as the density of the air in the system, compared with that of the outer atmosphere, may differ to such an extent as to cause a reversal of currents, or water flowing down the vertical stacks or through the drains, may force it into the sewer or through the fresh air inlet. To prevent either vacuum or back pressure, an auxiliary pipe is attached to the branch pipe, just in front of the trap outlet. This will prevent air being forced through the trap seal in either direction. With this arrangement there is no compression of air, but a natural and simple circulation throughout the whole system.

When practicable, ventilation pipes or soil and waste pipe extension should run beside a heated flue. The result of being placed in this position will be the rarification of the drain air, causing it to rise and assist naturally in ventilating the entire system.

LEGAL DEPARTMENT

Information for this Department is requested from Architects, Engineers, Contractors and Builders. Send in the particulars of recent cases in which you were interested giving the main facts tersely.

Finality of Architect's Certificate—Judgment for $1,470, the full amount of their claim, was recently given Charles and George Smallwood, contractors, Toronto, against one Charles W. Powell. The defendant owns lots 32 and 33 on St. George street, Toronto, and signed a contract with the pplaintiffs to do the excavating, masonry, brick and concrete work on a house and stable he wanted erected on the property. The contract called for $5,895. Mr. C. J. Gibson, the architect, was to supervise the work. Mr. Gibson, the plaintiffs claim, had the power to order extra work, which he did, to the amount of $105. He also issued a final certificate on December 18, 1908, stating that there was a balance due the contractors of $1,270, and on April 30th a progress certificate, entitling them to $200 more. The defence claimed that the architect had no right to order the extra work or issue the certificate, and also entered a counter-claim asking that the work be done over again, as most of it was done poorly. His Lordship thought that the architect was perfectly within his rights, and gave judgment for plaintiffs accordingly.

Mechanics' Lien Case—A judgment of some interest in a mechanic's lien case has just been rendered in the British Columbia court by Judge Lampman in Sheritt v. McCallum. One, John Young, agreed to build a house for the defendant at Foul Bay, the plasterer "to make good all defects and make good after other tradesmen have finished." Plaintiff was sub-contractor for the plastering and completed his work on July 14th last. On applying to Young for his money, $160, the latter told him he had thrown up the job. Becoming unable to complete his contract, Young had abandoned it, and McCallum finished it by day labor. On July 30th, Sherritt gave notice of a lien, but did not file it within 31 days after the completion of his work, as required. Instead, he endeavored to get on the premises to do some touching up after the other tradesmen, but plaintiff's foreman would not allow him on. On August 25th he got in and did four or five hours' work, and subsequently took the present action. Judge Lampman held that plaintiff was a trespasser on August 25th, and had express notice that he was not wanted to do any more work. The circumstances showed plainly that he was not making a bona fide attempt to complete his contract, but was instead trying to manufacture a lien, and his action must, therefore, be dismissed with costs.

Mr. Victor D. Horsburgh, A.R.I.B.A., of Edinburgh, Scotland, who has been appointed supervising architect to the Dominion Realty Company, Limited, has arrivevd at Toronto, the headquarters of the company. Mr. Horsburgh was the successful candidate out of over 500 applicants for the position.

Building permits issued at Strathcona, Alta., during 1909 amounted to $572,330, as against $121,525 for 1908. City Engineer McLean looks for a large increase this year.

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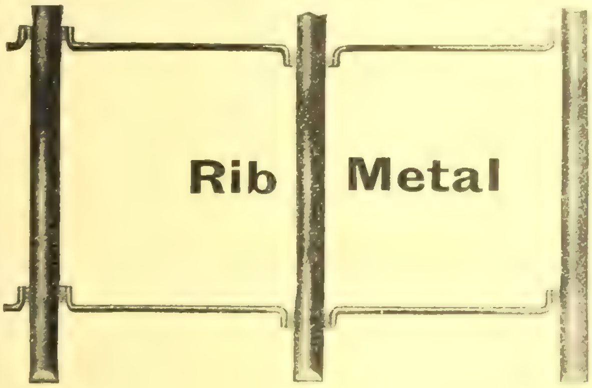

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MADE IN WALKERVILLE, ONTARIO

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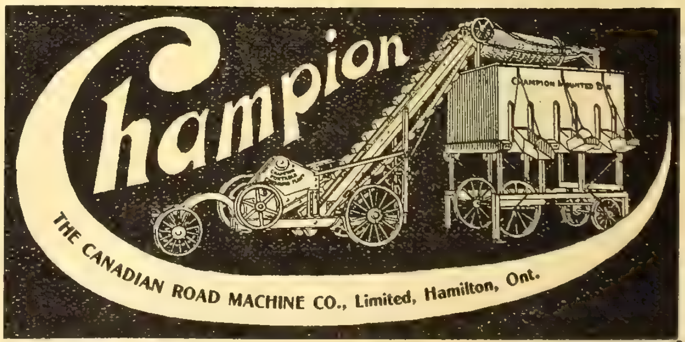
Automobile Fire Apparatus and Motor-Driven Vehicles of all kinds, our Latest Production.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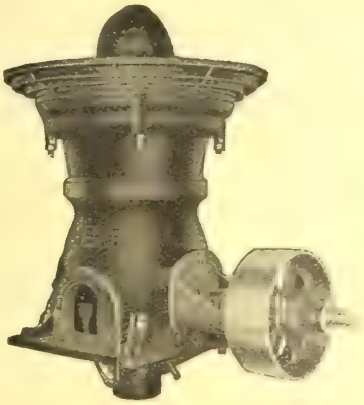

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Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

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The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

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The "Belleville" brand of Builders' [illegible] Canada is placing as high class an [illegible]

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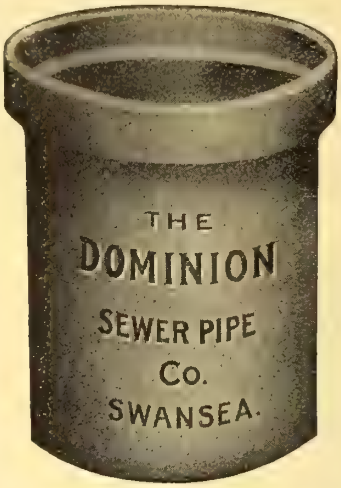

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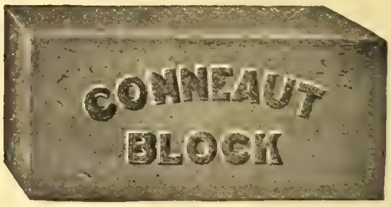

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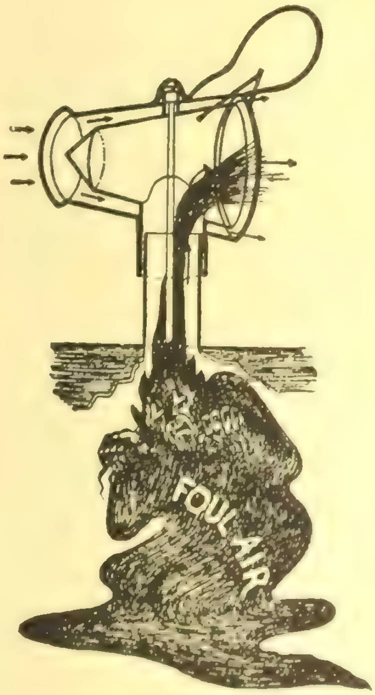

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Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, for foundation work	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b. with 30 and 5 per cent. off for wholesale:—

	Star	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7.25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, any color, ¾-in. square, 1-in. hex. and 3-16-in. round, 35 cents per square foot up.
Floor Tile—½-inch square, 45 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 35 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish, colors, firsts, 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G. cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 23 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Brass Goods, Valves, etc.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.
Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.
No. 4 compression bath cock........net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Furnaces, 45 per cent.; registers, 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.; other specials, 40 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00

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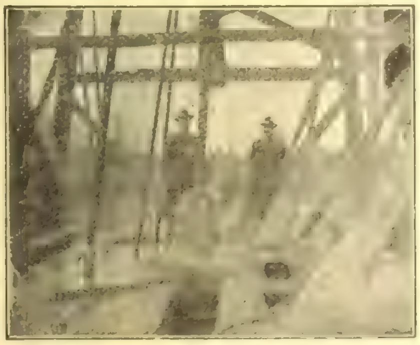

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Lead Pipe.

Lead pipe, 27½ per cent. off.; lead waste, 27½ per cent. off; caulking lead, 4½ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 70; malleable bushings, 67½; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 67½ per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.

7 and 8-inch pipe, 40 per cent.

Light pipe, 60 per cent.; fittings, 70 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots in bags, delivered, Toronto, bags extra, $1.70.

Cement, wholesale lots of 1,000 barrels, f.o.b. Toronto, $1.30.

Crushed stone, $1.25 per ton, f.o.b. Toronto.

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $13.50 to $15 per toise.

Free stone, delivered, $13.50 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.20 to $1.25 per ton.

Scotch fire brick, delivered, $30 to $35 per thousand.

Steel channels and beams, $2.75 per 100 pounds, delivered.

Lime, per cwt., delivered, 38 cents.

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plasters, $5.50 per ton.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $7.50 to $8.00 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.

Pure Green Seal Zinc White, ground in oil, $12.50 to $13.00 per 100 lbs.

Boiled Linseed Oil, in barrels, 78 cents per gallon of 9 lbs.

Raw Linseed Oil, in barrels, 75 cents per gallon of 9 lbs.

Turpentine, in barrels, 80 cents per gallon of 8 4-10 lbs.

Pure Linseed Oil Putty, 25-lb. tins, $3.25 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $2.75 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

A company is being formed, so it is said, composed of the leading capitalists of Port Arthur, to construct and put into operation in that city by the middle of the [illegible]

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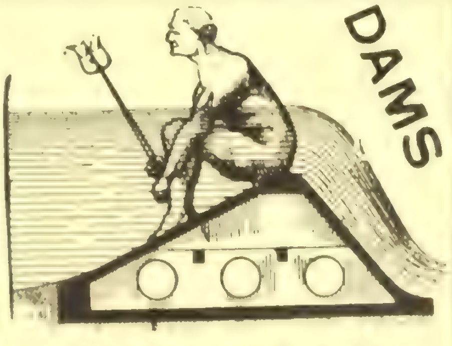

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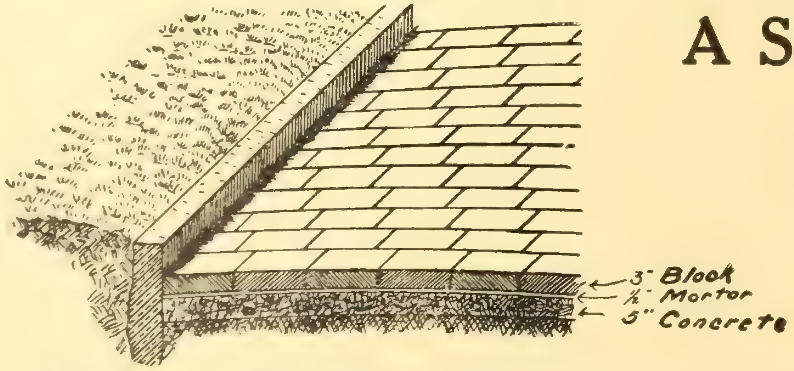

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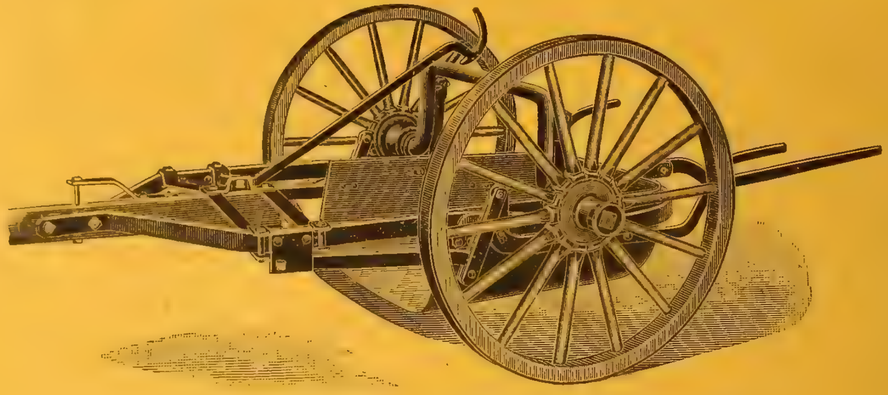

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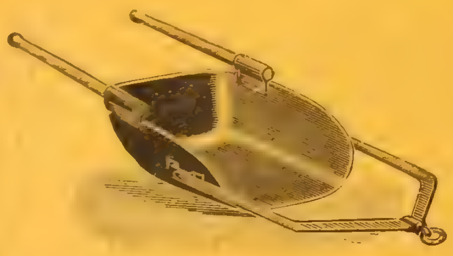

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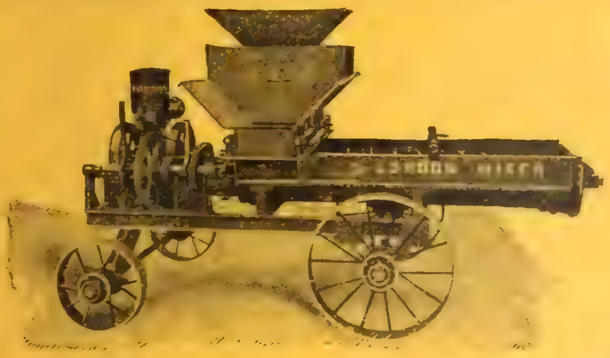
Municipal Progress, Advance Information

Vol. 24 Toronto, February 16, 1910 No. 7

The London Automatic Batch Concrete Mixer No. 2



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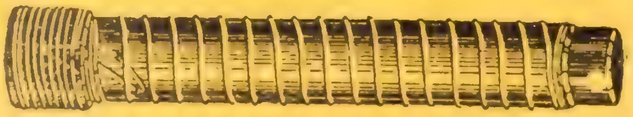

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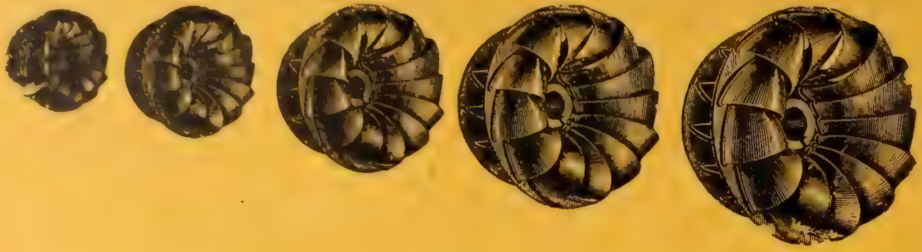

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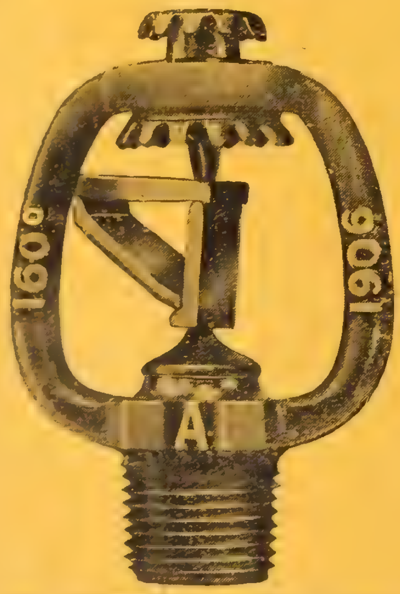

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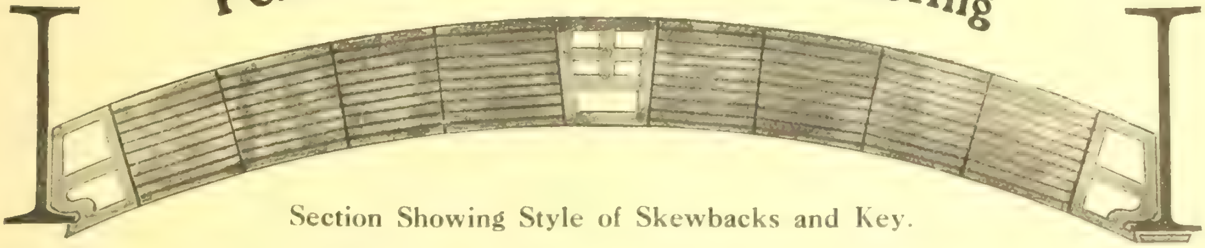

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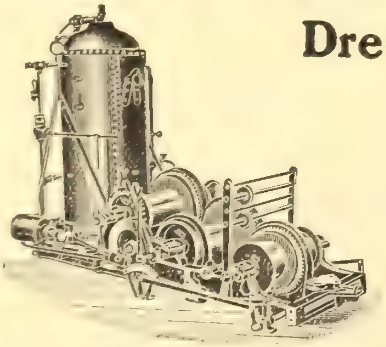

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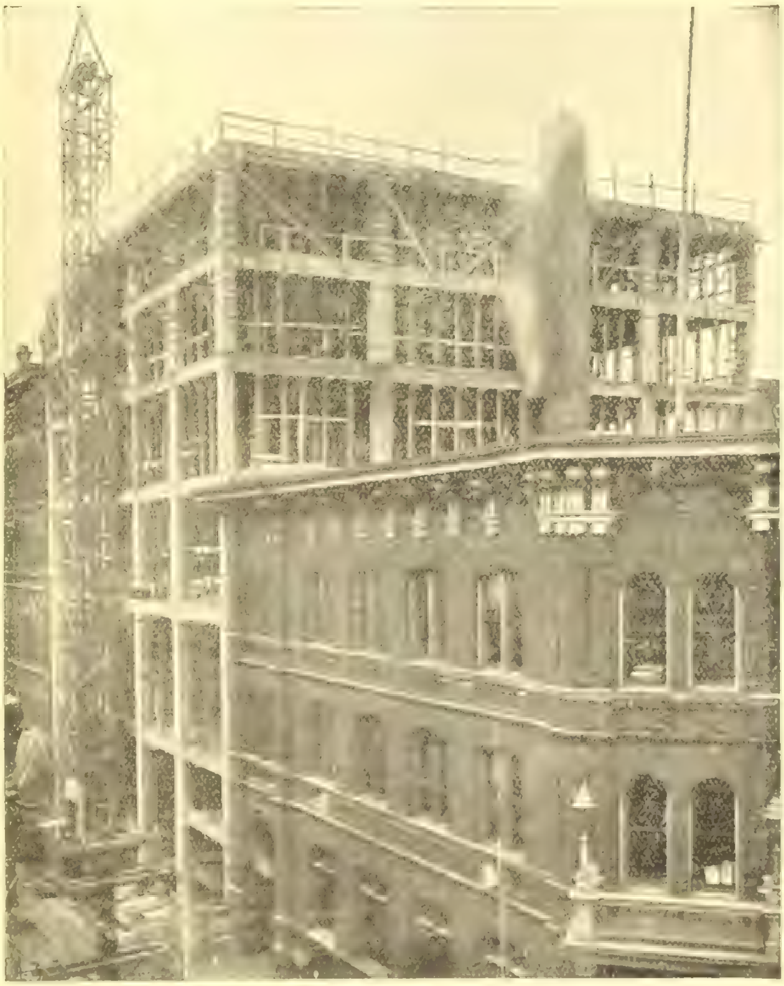

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A few hours' work and a few dollars will put a modern and permanent culvert in place of a ramshackle bridge. Easily laid by anybody.

Made of Special Billet Iron, Extra Heavy

In every size of Pedlar Culvert, which comes in all standard diameters from 8 inches to 6 feet, we use nothing but the best grade of Billet Iron, specially made for us, of extra-heavy gauge (14 to 20 gauge, according to the diameter). This Billet Iron is curved into semi-cylinders—curved COLD, so there will never be any variation from exact dimensions; and it is then deeply and smoothly corrugated on a special press that puts a pressure of SIXTY TONS on every square inch of the metal. The corrugations, therefore, are uniform and very deep.

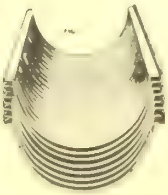
Galvanized After Being Pressed Up

When the corrugating process is done, the sections are galvanized by our exclusive process that covers the entire surface with a thick coating of zinc spelter. Every edge, every crevice, is heavily coated with this rust-proof, corrosion-proof galvanizing, not a spot is left unprotected. This is the **only** culvert galvanized **after** being shaped. Is absolutely **Rust-proof.**

Will Stand Incredible Strains

The heavy-gauge Pedlar Billet Iron sections deeply corrugated and locked together **without bolts or rivets** by our compression triple-rib (the ribs that [illegible] not corrugated), make a culvert that will stand enormous crushing strains and neither give nor spring. A thin cushion of soil on top is all the protection such a culvert needs against traffic; and no special precautions need be observed in laying it,—it will stand what no other culvert can.

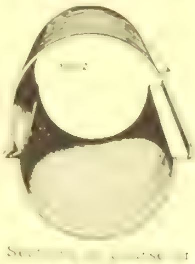
Compact—Portable Easily Laid



Half-sections nested for shipment

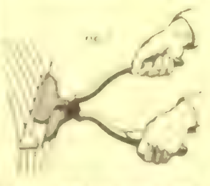
Pedlar Culverts are shipped in half sections, nested—see Fig. 1. Saving freight charges and making carriage easy in roughest country. Quickly and easily transported anywhere.

Note that the ribs are flat, and the curved part of the cylinder deeply corrugated. These ribs add vastly to the culverts strength.



Sections in course of assembling

Unskilled labor, with a single tool, quickly clamps the flanges together, making a triple-fold joint that is tighter [illegible]



[illegible] -no bolts, no rivets, [illegible]

Frost-Proof, Rust-Proof, and Wear-Proof

This triple-rib flange-lock principle, found only in Pedlar Culverts, not only adds greatly to the strength of the piping and makes a perfect joint—practically as good as if welded—but it also allows for expansion and contraction under cold or heat. Though a Pedlar Culvert, of any length, be frozen solid full of ice, it will not split nor spring a leak.

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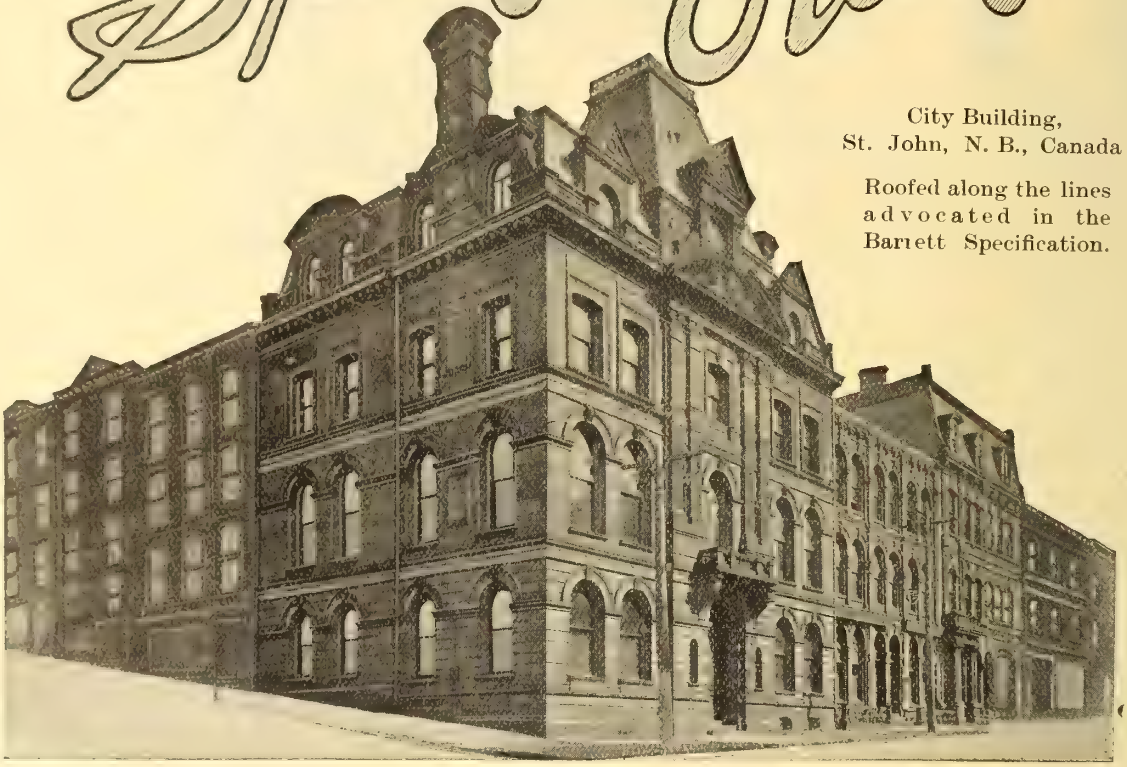
Barrett Specification Roofs



City Building,
St. John, N. B., Canada

Roofed along the lines advocated in the Barrett Specification.

After Twenty-Seven Years of Service

THE roof of this structure was laid in 1882. A letter recently received from the contractors states that it is still in good order *after 27 years of service.*

As compared with other kinds of roofing, and considering the wide variation of temperature in New Brunswick, this is an astonishing record. It emphasizes the satisfactory results which Barrett Specification Roofs invariably give.

The architect or owner of a building who will order his roofing laid "according to The Barrett Specification" and *insist that the Specification be followed to the letter*, is absolutely assured of *satisfactory service.*

It is well to remember that with Barrett Specification Roofs there is no maintenance expense whatever. Metal and Ready Roofings *require paint and attention every few years* to insure freedom from leaks and trouble.

Every architect, engineer and owner should have The Barrett Specification on file. We will send same promptly to anyone interested on request to our nearest office.

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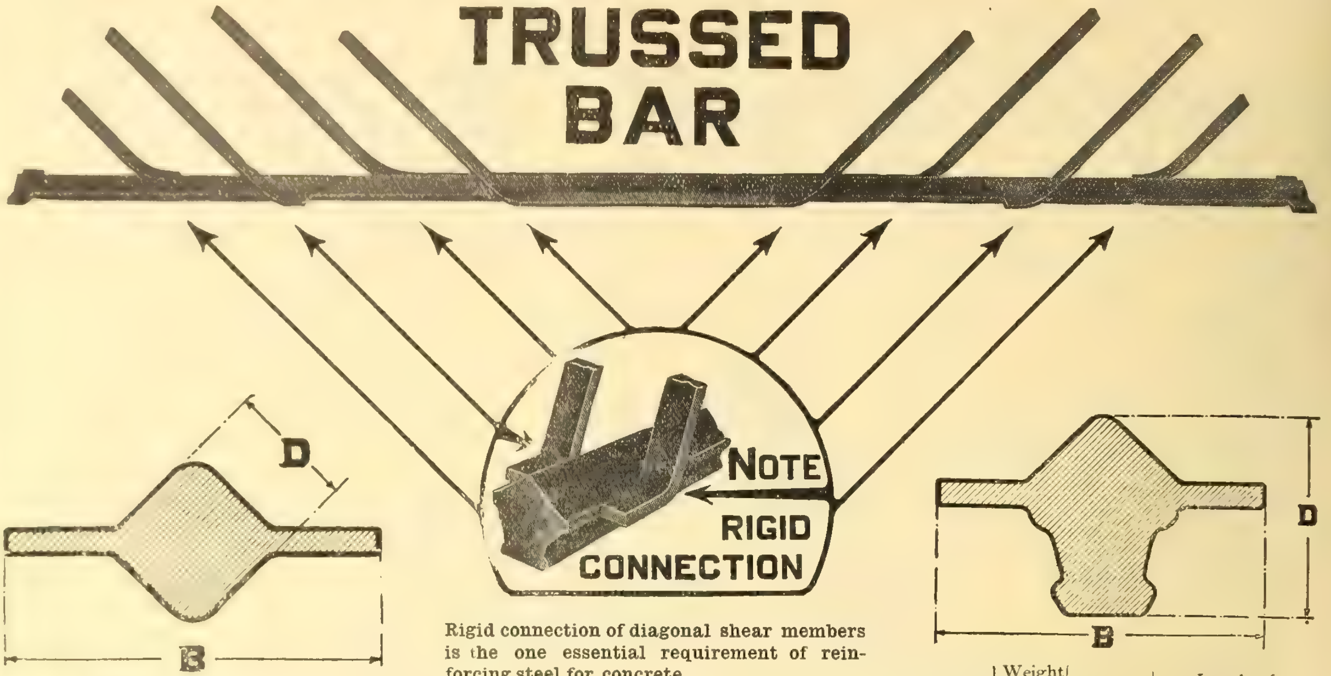
KAHN TRUSSED BAR



D. & B.	Weight per lineal foot	AREA	Lengh of Diagonals
[illegible] x 1½ in.	1.4 lbs	0.41 sq in.	6 in., 8 in., 12 in.,
[illegible]	2.7 lbs.	0.79 sq. in.	12 in., 8 in., 18 in.,

Rigid connection of diagonal shear members is the one essential requirement of reinforcing steel for concrete.

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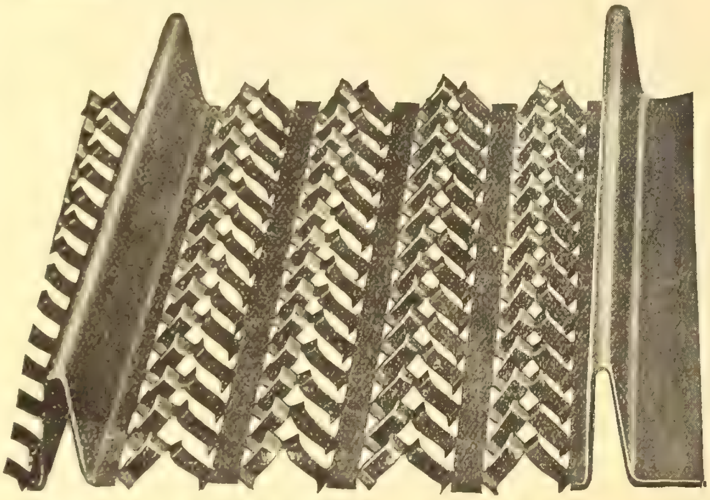
1¾ x 2¾ in.	6.8 lbs	2.00 sq. in.	**24**, 18, 30, 36 inch
2 x 3½ in.	10.2 lbs	3.00 sq. in.	**30**, 24, 36, 48 inch



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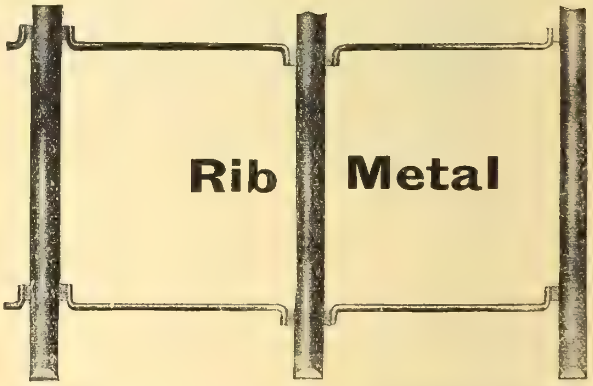
Hy-Rib is furnished in either flat or curved sheets. The shop-bending assures absolute accuracy of curve.

Cross sectional areas of **Hy-Rib** per foot of width: 28 gauge, .165 sq. in., 26 gauge, .198 sq. in.; 24 gauge, 264 sq. in.

Above gauges carried in stock. Other gauges can be supplied within a reasonable time.



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Size No	Width of Standard Sheet	Square Feet per Lineal Foot of Standard Sheet	Area per Foot of Width
2	16 in.	1.33	.54 sq. in.
3	24 "	2.00	.36 "
4	32 "	2.67	.27 "
5	40 "	3.33	.216 "
6	48 "	4.00	.18 "
7	56 "	4.67	.154 "
8	64 "	5.33	.135 "

Catalogues of **Kahn System Products—Kahn Trussed Bars, Hy-Rib, Rib-Metal, Rib-Lath, Rib-Studs, Cup-Bars.** Also catalogues describing tests, structures of every kind, and "Kahn System Standards"—the best handbook on reinforced concrete design.

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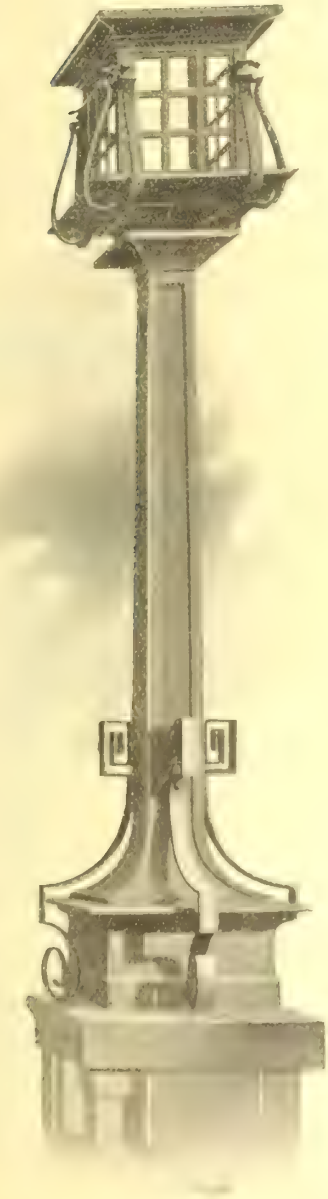

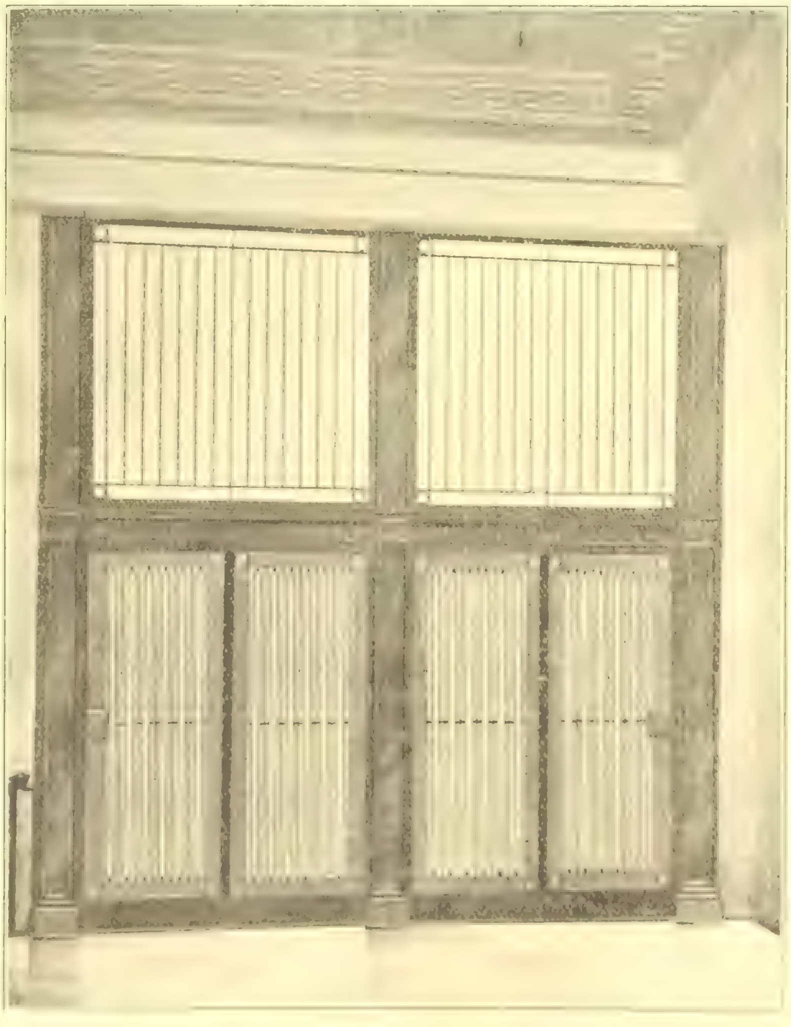

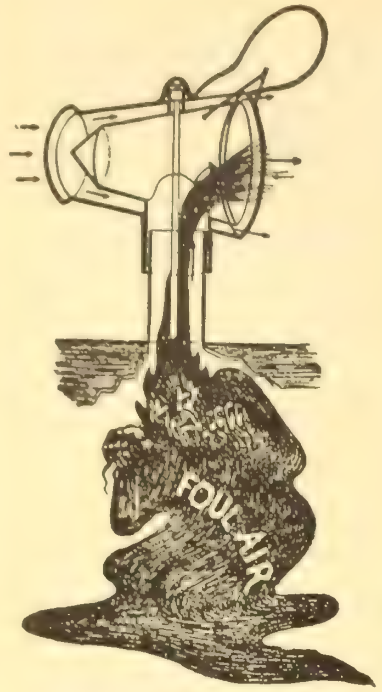

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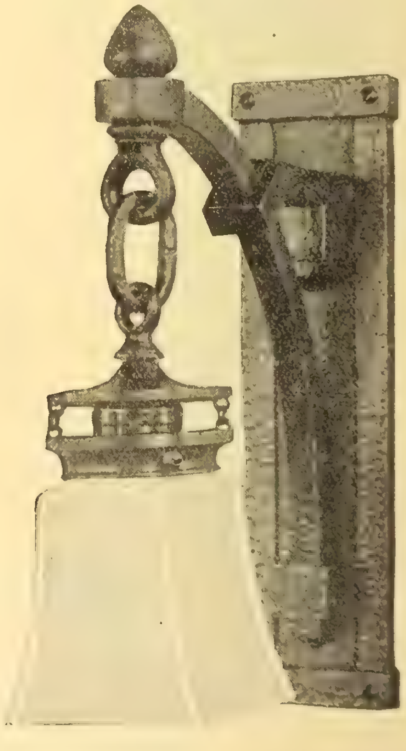

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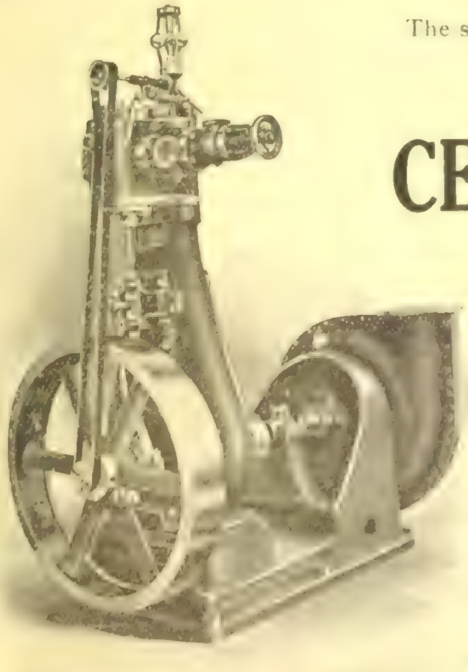

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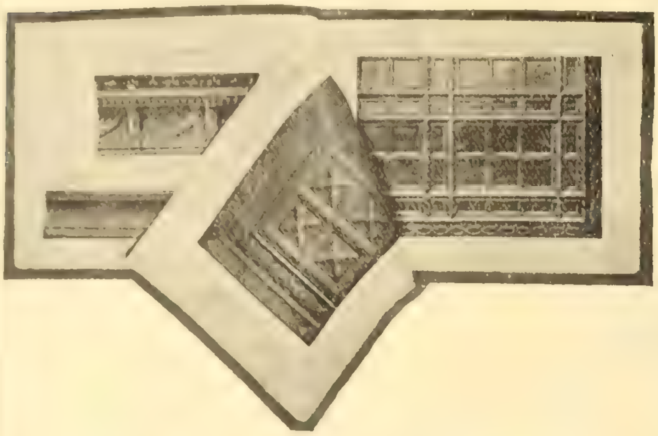

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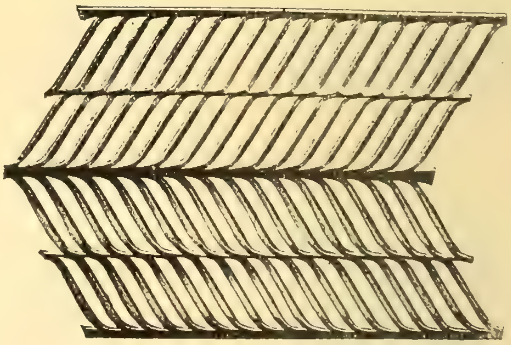

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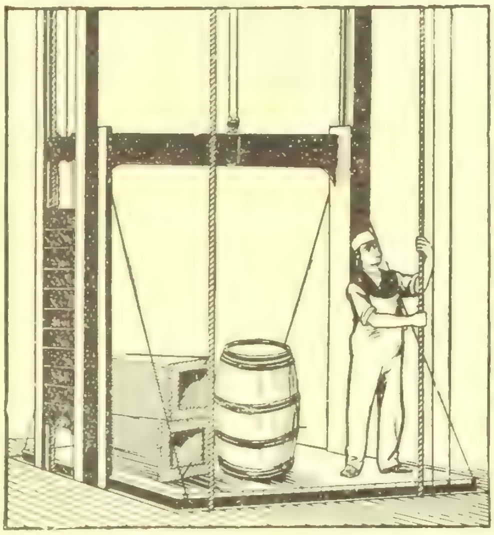

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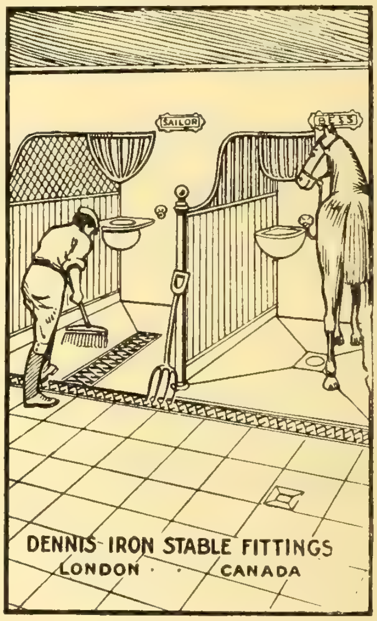

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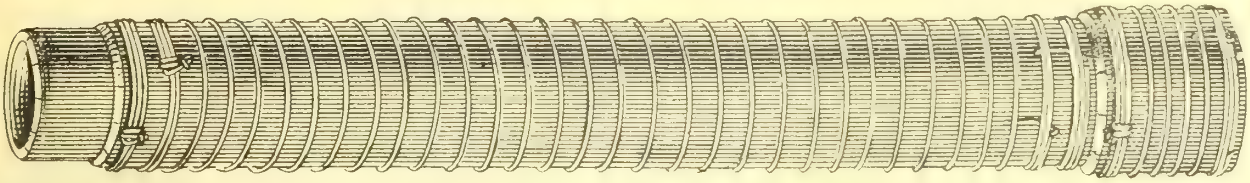

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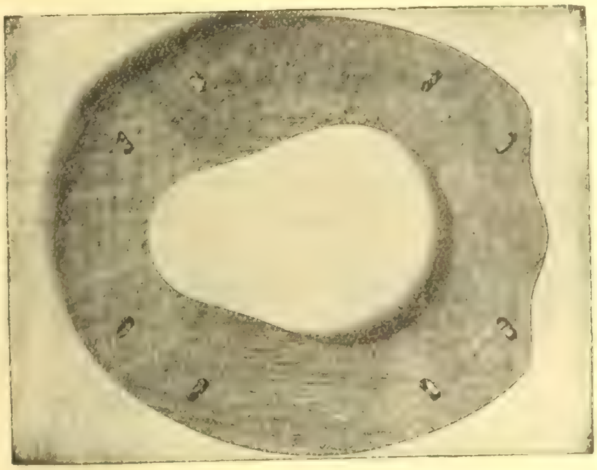

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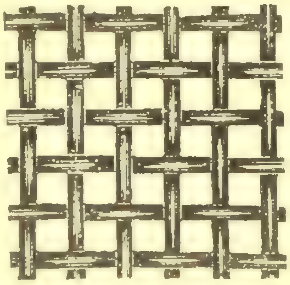

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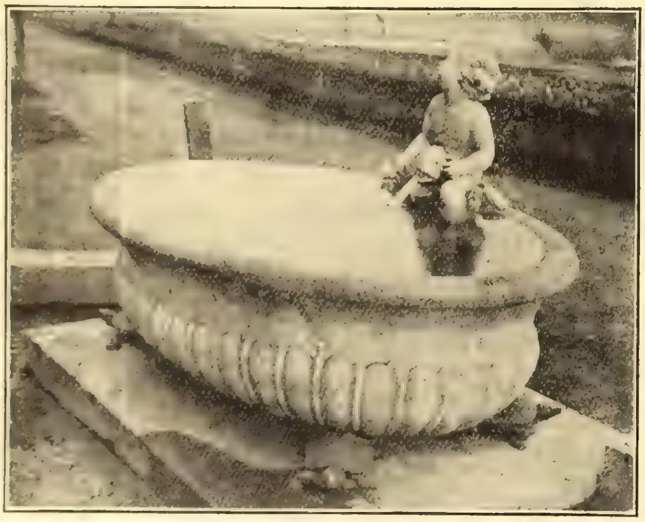

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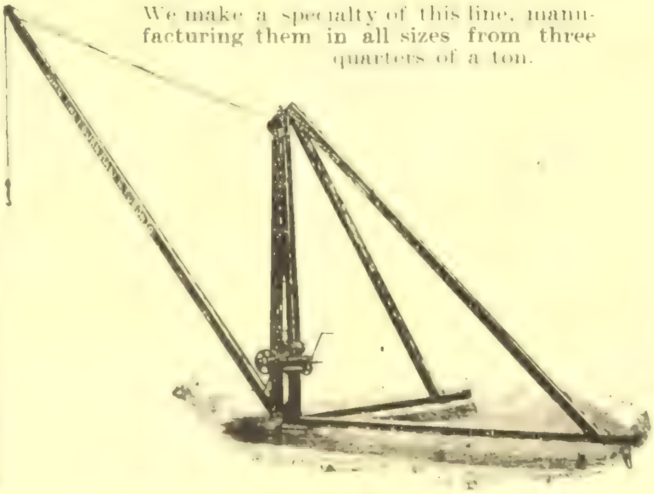

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Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Calgary, Alta.
Tenders will be received until February 25th for cast iron pipe, valves, hydrants, specials, etc., for the proposed waterworks extension. H. E. Gillis, City Clerk.

City Engineer Childs is preparing plans for a trunk sewer and septic tanks to cost $800,000.

Edmonton, Alta.
Tenders will be received by the City Commissioners until February 19th for the supply of lead pipe, galvanized iron pipe, black iron pipe and brass goods for the year 1910. Specifications at Waterworks Department, corner Rice street and McDougall avenue.

Kingston, Ont.
Owing to the discovery of leaks in the intake pipe at the Kingston waterworks the municipal committee is taking steps to install a new pipe.

Moose Jaw, Sask.
At the meeting of ratepayers on the 3rd inst., it was decided to take up the matter of street paving.

New Glasgow, N.S.
The city council is again considering plans for increased water supply at an estimated cost of $175,000.

Nanaimo, B.C.
Tenders will be received up to the end of the current month for the supply of vitrified clay pipes required in connection with the sewering of the city. Specifications and particulars can be obtained of Allan Waters, City Engineer.

Point Grey, B.C.
The municipal council are advertising for tenders until March 9th for the purchase of roads and sidewalks bonds. For road purposes $300,000 of five per cent. 50-year are to be issued, and for sidewalks, $25,000 of five per cent. 25-year.

Quebec, Que.
The civic committee has recommended the issue of $235,000 debentures: $200,000 for permanent walks and $20,000 for waterworks extensions.

Sweetsburg, Que.
A bylaw was passed recently to raise $9,000 debentures for the purpose of installing a water system or acqueduct and reservoir.

Toronto, Ont.
Tenders are being called until February 22nd by the Board of Control for a 42 inch hydraulically operated stop valve. For further particulars see advertisement in this issue.

Vancouver, B.C.
Tenders addressed to W. McQueen, city clerk, will be received until February 23 for supply of galvanized iron pipe and brass for waterworks department. Specifications at waterworks office, city hall.

AWARDED.

Hamilton, Ont.
The Board of Control has awarded to the London Brass Company the contract for the brass work for water mains at $3,000. Chadwick Bros., a local firm, tendered at $3,447.

Toronto, Ont.
The following contracts for sewers have been awarded by the city council: Algonquin avenue, Keele street to Indian road, John F. Connolly, $687; Baker street, Clinton avenue to west end, John F. Connolly, $1,439; Breadalbane street, St. Vincent street to first lane east of Surrey Place, Page & Britnell, $496; Clinton avenue, Lawton avenue to 588 feet east of Oriole road, John F. Connolly, $1,257, the lowest; Duggan avenue, Lawton avenue to west end, John F. Connolly, $1,531, the lowest; Garden avenue, Keele street to Sunnyside avenue, John F. Connolly, $1,697, the lowest; Geoffrey street, Keele street to Indian road, John Maguire, $948, the lowest; Glendale avenue, Garden avenue to Wright avenue, John Maguire, $1,054, the lowest; Gordon avenue, Clarence avenue to north end, J. H. McKnight Construction Company, $199, the lowest; Gormley avenue, Lawton avenue to west end, Page & Britnell, $2,000, the lowest; High Park Boulevard, Keele street to Sunnyside avenue, John F. Connolly, $1,435, the lowest; Indian road, G. T. R. to Geoffrey street, John F. Connolly, $4,487, the lowest; Keele street, G. T. R. to Geoffrey street, John F. Connolly, $6,787, the lowest; Lawton avenue, Heath street to north city limit, John F. Connolly, $3,582, the lowest; Westminster avenue, Keele street to Indian road, John F. Connolly, $1,124, the lowest; Wright avenue, John F. Connolly, $1,258, the lowest.

Weston, Ont.
The Canada Foundry Company have, by this municipality, been awarded the contract for hydrants, steam nozzles, street sprinklers, cranes, and gate valves for the new waterworks.

Railroads, Bridges and Wharves

Como, Que.
The ratepayers will vote on a by-law to issue $30,000 road and bridge debentures.

Edmonton, Alta.
It is stated that no provision has been made in supplementary estimates for East End bridge.

Montreal, Que.
As a result of a conference between Mr. William Whyte, second vice president C. P. R., and Sir Thomas Shaughnessy re appropriations for Western Canada, the following proposed lines and mileage are reported: [illegible] Kootenay Valley line, 20; total, 517; this with bridges at Outlook and Edmonton constitute the year's policy. Noted previously.

Ottawa, Ont.
The Ottawa, Montreal & Eastern Railway Company has been incorporated to build a line from Lake Megantic through the intervening counties, crossing the St. Lawrence to Montreal at Longueil, thence to Ottawa. The company is also given power to construct a bridge or tunnel across the St. Lawrence at Longueil. The work must be started within three and completed within seven years.

Palmerston, Ont.
It is understood that the Grand Trunk intend to erect a new roundhouse of a permanent character here.

Port Arthur, Ont.
It is stated that the work will be begun in the immediate future on the construction of a new bridge across the Neebing river.

St. Catharines, Ont.
Plans for the high level bridge over the old Welland canal were submitted by the promoter of the company, Ald. Dr. Merritt, at a meeting of the Board of Trade on the 9th inst. Cost, $150,000. The bridge will be built this year. Estimates from contractors and bridge builders have been obtained, and all the preliminaries arranged. Noted in issue of February 9th.

Strathcona, Alta.
Ratepayers of this city voted in favor of giving $50,000 as their share of the C. P. R. high level bridge connecting the city with Edmonton.

Sydney Mines, N.S.
Tenders addressed to A. W. Campbell, Chairman, Government Railways Managing Board, Ottawa, Ont., will be received until March 15th for the construction of a line of railway between George's River and Sydney Mines, N.S., a distance of 9.09 miles. Plans, etc., at the Station Master's office, Sydney Mines, N.S., and at the Chief Engineer's office, Moncton, N.B.

The I. C. R. is also calling for tenders for a line of eight miles between Chatham and Nelson, N.B., and for the construction of buildings on the Elmira branch, P.E.I.

Toronto, Ont.
The Temiskaming & Northern Ontario Railway Commission are calling for tenders for grading of their railway between M.P. 60 and M.P. 61. For further particulars see advertisement in this issue.

Weyburn, Sask.
Work is expected to begin on the enlarged shops on April 1st.

Winnipeg, Man.
Tenders addressed to the Chairman, Board of Control will be received until February [illegible] for the supply of labor and materials required in the erection of pile trestle bridge over [illegible] creek, Portage avenue. Plans, etc., at office of City Engineer. M. Peterson, secretary.

Walkerton, Ont.

The County of Bruce have sold $20,000 bridge debentures.

York Mills, Ont.

Tenders will be received at the Department of Public Works, Fredericton, N.B., for rebuilding York Mills Bridge. Plans, etc., at office of above and at office of T. Robison, M.P.P., Harvey station, York Co., N.B., and at Local Government Rooms, 4 Church street, St. John, N.B. John Morrissy, Chief Commissioner.

AWARDED.

Fort William, Ont.

J. J. Flanagan has started construction on the new city dock which is to be constructed on the Kaministiquia river at the foot of McVicar street. Contract price, $8,000, while the city will spend an additional $[illegible] in permanent improvements. The dock is to be completed by the opening of navigation.

Toronto, Ont.

The contract for the double tracking of the Temiskaming & Northern Ontario Railway between Cobalt and North Cobalt has been awarded to Mr. R. J. McGarr. The work will be commenced at once.

Public Buildings, Churches, Schools, etc.

Burnaby, B.C.

The parishioners of St. Alban's church (Anglican), have decided to undertake the building of a rectory. P. R. Brown, Edmonds street, is interested. Rector, Rev. David Dunlop.

Chatham, Ont.

Tenders have been called for all trades in the erection of a stone, brick and frame school building on 4th concession. J. L. Wilson & Son, architects, this city.

The Y. M. C. A. have an option on a central location for a building here. When the required $2,000 has been raised the work on the construction will be started.

Edomnton, Alta.

It is stated that the Salvation Army will shortly close on the purchase of a large block, where the intention is to erect an armory during the summer, their headquarters for Northern Alberta. Mr. Travis Barker, of this city, is interested.

Fort William, Ont.

A movement has been inaugurated to build a general hospital for this district on the Canadian Northern Railway.

Hull, Que.

Plans and specifications have been prepared by the city engineer for the two new fire stations. They will be considered by the council next week.

Hamilton, Ont.

The Joint Court House Committee has approved the plans for the new registry office and instructed County Clerk Jardine to advertise for tenders at once.

Kenora, Ont.

We have been informed that the completion of the Court House will be performed by day labor. Noted in issue of January 19th.

Kildonan, Man.

A bylaw will be submitted to the ratepayers on March 12th on the question of a new school building.

London, Ont.

City Architect Nutter has submitted plans for the Colborne street school, which were approved in the main.

Ladysmith, B.C.

The plans for a new lodge building for the society of the Knights of Pythias of New Westminster, are under way. The area to be covered will be probably 60 by 100 feet, and the building will be two, and perhaps three storeys in height. It is hoped with government aid, to start work on the building of the new hospital this spring.

Montreal, Que.

The Montreal Art Association has decided to take over the Holton property on Sherbrooke street, where in the near future large galleries will be erected. Annual meeting in a few days. Dr. F. J. Shepherd, 152 Mansfield street, president. J. Abbott, secretary. Competition in plans is said to be favored.

The Board of Protestant School Commissioners have accepted the plans submitted by Architect A. F. Dunlop, for the William Dawson School, which is to replace the Berri Street School. In all seventeen designs were submitted. The new school will be fireproof throughout and will be heated from a separate building erected for that purpose. Mr. Dunlop is also instructed to prepare plans for a new school building to be erected on Sanguinet street to replace the Belmont street school.

It is understood that in the near future the sisters of the Hotel Dieu will undertake the erection of a new hospital. Estimated expenditure $100,000.

A. F. Dunlop, Lindsay Building, is preparing plans for the extension of the Earl Grey school building, to double its present capacity.

The trustees of the public school board of Rosemount, Que., will erect a school building during the present season. Mr. A. F. Dunlop, architect, Lindsay Building, is preparing the plans, for same. The building will be approximately 65 feet by 65 feet and provision will be made for extensions at a later date.

Nakusp, B.C.

The Masons, here, intend to erect a hall, towards the cost of which $1,000 have already been subscribed.

New Westminster, B.C.

The erection of a $25,000 Y. M. C. A. building will be started shortly.

New Liskeard, Ont.

A new opera house is to be built here on Armstrong street by Mr. M. Abraham at a cost of about $9,000.

North Sydney, N.S.

Tenders for the construction of the new Catholic church on Archibald avenue, will be received until February 22nd. Plans, etc., at the house of the parish priest, W. F. Kiely.

North Vancouver, B.C.

The foundation for the proposed Knights of Pythias' Hall, to be built at the corner of 4th street and Chesterfield avenue will, it is expected, be commenced by the first of April.

Owen Sound, Ont.

Mr. J. S. Russell, of Stratford, is the architect for the West Side Methodist Church, and he has designed a very handsome and commodious building. The church will be built of brick, with stone trimmings.

Ottawa, Ont.

The Library Committee of Parliament is considering the erection of a second library building for the Government Library, at this city. Plans have been prepared by Public Works Department.

It is probable that a new Roman Catholic church will be erected in the Glebe, and also a mission in the southern portion.

It is announced that work will likely be started in the early summer on the new Government block, on Sussex street.

Peterborough, Ont.

Dr. R. Bruce Smith, the provincial inspector, has condemned the Protestant home.

Prince Albert, Sask.

It is reported that Superintendent Dickinson, of the Penitentiary Binder Twine Department, will, with a number of convicts, assist in the construction of the new penitentiary here.

Phoenix, B.C.

The School Board is sending a largely signed petition to the provincial government asking for a grant of $10,000 toward the building of a new school.

Prince Rupert, B.C.

The new post office building will be begun this summer with a preliminary appropriation of $50,000.

Portage la Prairie, Man.

The ratepayers will be asked to vote on a bylaw authorizing the borrowing of $20,000 for 25 years, at 5 per cent. for the purpose of paying for the erection and furnishing of a new four room solid brick school, with full basement, in the north ward of the city.

Revelstoke, B.C.

It is reported that the Sisters' hospital will be commenced this year. There will be a convent and school asosciated with it. Seventy thousand dollars are said to be available for the building.

Sinclair, Man.

W. A. Elliott, architect, Brandon, has completed ararngements for drawing plans for a new school here.

St. Catharines, Ont.

Tenders will be received until February 21st for all trades required for the erection of a public school building for school section No. 3, Niagara Township. James Craise, secretary-treasurer, Niagara-on-the-Lake. A. E. Nicholson, this place, architect.

Smith's Falls, Ont.

Plans have been prepared for a new hospital, which when completed will cost $30,000.

Stratford, Ont.

Tenders have been called for the different trades required for the erection of an addition to the General Hospital. T. J. Hepburn, arcihtect. W. Preston, Chairman Hospital Board.

Sudbury, Ont.

Tenders are being received until February 22nd for painting, tinting and decorating the interior of the Presbyterian church. S. E. Wright, secretary.

Saskatoon, Sask.

Tenders will be received by J. D. Ferguson, this city, for the complete erection of a business block. Plans, etc., at Builders' Exchange, Winnipeg, after 14th inst., and also at the office of the architect, W. W. LeChance, of this place.

Trail, B.C.

The Board of Trade is asking the provincial government for a $10,000 appropriation for a new school building.

Toronto, Ont.

An extenson to cost approximately $65,000 will be mde to the Church of Our Lad of Lourdes, Sherbourne street. Plans have been prepared by Architect J. P. Hynes, 199 Yonge street. Tenders will be called for in March.

The announcement has been made that a new Roman Catholic seminary is to be erected in Toronto archdiocese for the final training of young priests. The donation of $150,000 by Mr. Eugene O'Keefe, for this purpose, leaves an additional $100,000 to be raised. Rev. Father Whelan, rector of St. Michael's Cathedral. Mr. Holmes, architect.

Having passed the plans for the new wing at the Isolation hospital, the Board of Control have decided to advertise for tenders for its construction. The estimated cost is $102,000.

An amount will be placed in the estimates of the Superintendent of Buildings for the enlarging of the Humberside Collegiate Institute. The Property Committee of the Board of Education decided also to recommend the erection of a new building on the Manning avenue site. The advisability of making changes in York Street school, or of building a new school on that site, was referred to Mr. Bishop.

Tenders are being called for the various works on Bonar Presbyterian Church. Architect, A. M. McKenzie Brydon, 30 Toront street.

Dr. George H. Locke, Chief Librarion of the Toronto Public Library, is in favor of establishing a branch library down town. He says if the city gave the site, the Library Board could finance the building. His proposition is to have a plain four-storey building.

The Canadian Order of Foresters have obtained a building permit for their hall at 20 and 24 College street, $50,000.

E. J. Lennox, Bay street, has submitted his plans for the west wing of the Parliament Buildings. By them, it is proposed to raise the walls of the west wing of the building four feet, which, with the wall already in place, will provide another storey in the building, where forty offices can be provided. It is understood that directly that work is finished the east wing will be remodelled, made fireproof, and probably raised four feet to conform with the west wing. The cost of providing the forty additional offices in the west wing would be thirty or forty thousand dollars.

Victoria, B.C.

Ratepayers have passed a $184,000 school bylaw.

Time for receiving tenders for the new Y. M. C. A. building is extended to the 18th day of February, 1910. H. S. Griffiths, architect, 1006 Government street, Victoria.

The James Bay Athletic Association Club at their annual meeting discussed the proposition for a new building. President, H. D. Helmeken, K.C.; secretary-treasurer, V. K. Gray.

Vancouver, B.C.

It is stated that the Metropolitan Building Company have on hand the construction of new club premises. The Terminal City Club, of which R. L. Reid, K.C., is a member, is interested.

The Victoria Order of Nurses are planning to erect a new home if a suitable site can be secured. Mrs. Burnett, secretary, 801 Burrard street.

Watford, Ont.

Tenders for remodelling school buildings in S.S. No. 17, Warwick, will be received until March 1st. For futher particulars address E. Doan, secretary, [illegible]

Welland, Ont.

Tenders addressed to A. Asher, secretary Board of Managers, will be received until March 4th for the erection and completion of a Sabbath school building in connection with the Presbyterian church, and also certain modifications in the present church.

Winnipeg, Man.

The addition to the Anglican church, at Fort Rouge, will be rushed to completion with all possible speed when spring opens. The foundation has been already laid and some other work done. Estimated cost, $10,000.

It is stated that two, instead of five, fire halls will be constructed this year; one at the corner of Burnell street and Sargent avenue, and one at the corner of Pritchard avenue and Sinclair street.

Yorkton, Sask.

R. H. Lock, secretary-treasurer, offers for sale $40,000 school debentures.

AWARDED.

Hamilton, Ont.

The Board of Education have awarded to the J. Hoodless Furniture Company the contract for the seating of Barton street school, $2,100.

Montreal, Que.

Eugene Payette, architect, 15 St. James street, has awarded the general contract for the erection of a Roman Catholic cathedral at Haileybury, Ont., to V. Ladouceur, general contractor, Ottawa, for the sum of $90,000.

Sydney, N.S.

The contract for the new St. Andrew's Presbyterian Church has been awarded to Rhodes, Curry & Company, Amherst, N.S., the price being $42,000. This figure is exclusive of the seating and other fittings. The church will be of either pressed brick or Scotch fire brick, with stone trimmings, and will seat 1,200 people. Total cost when completed, will be in excess of $50,000. Curry, & Sparling, 9 Yonge street, Toronto, architects. Noted in issue of December 29th.

Toronto, Ont.

Hall & Dollery Electric Company, Toronto, have been awarded the contract for the electric fixtures and wiring in the additions and alterations to the Toronto Armories.

Residences

Brandon, Man.

Architect Sinclair is preparing plans for Contractor Bullock for the large apartment on Lorne avenue, corner of Seventh street. Building operations will commence as soon as spring opens. Estimated expenditure, $100,000.

Hamilton, Ont.

M. Webb has a building permit for ten brick houses at the corner of Burlington and Hughson streets, for E. Kent, to cost $15,000.

Montreal, Que.

[illegible] street for Dr. L. Masson. Tenders will [illegible]

Ottawa, Ont.

The residence of Mr. A. F. Darnell, 243 [illegible]

Oakville, Ont.

The residence of W. V. Anderson [illegible]

Toronto, Ont.

The W. C. T. U. have bought property on Gerrard street as a building site for their new residence for working girls, the construction of which will probably be started within the year. Estimated expenditure, $30,000.

Victoria, B.C.

Commander Harrison, R. N., is erecting a handsome residence on his estate at Crawford Bay.

AWARDED.

Macduff & Lemieux, architects, 212 Merchants Bank Building, have awarded the contract for the erection of a residence in Cartier Park for Doctor Letourneau, to R. F. Laberge.

Business Buildings and Industrial Plants

Arrowhead, B.C.

It is stated that the C. P. R. will build a large hotel on the northern end of Arrow Lake. Plans for the building are complete, and work on the new building will be commenced shortly. The structure will be similar in some respects to the Chalet at Lake Louise, and will cost $100,000.

Clearwater, Man.

The International grain elevator was burned on February 6th. Loss not stated.

Edmonton, Alta.

C. C. Snowden, of Calgary, Canadian representative of the Independent Oil Company of Pennsylvaia, is authority for the statement that a large warehouse will be built here in the near future.

Five Islands, N.S.

It is understood that Bayne & Soley Bros., backed by some leading firms of Canada and the United States, will build mill warehouses, and offices in connection with the mining industry here.

Goderich, Ont.

The bylaws to grant fixed assessments to the Western Canada Flour Mills on the erection of a modern concrete elevator, capacity 500,000 bushels,, and also to the Goderich Elevator & Transit Company on the erection of a 500,000 bushel concrete storage in addition to their present plant were passed by the ratepayers. Building will commence as soon as weather permits.

Huntsville, Ont.

It is stated the work will start shortly on rebuilding the planing mill here, which was badly damaged on the 31st ulto.

Humboldt, Sask.

The Union Bank branch building was destroyed by fire on the 27th ult.

Knowlton, Que.

Mr. A. F. Dunlop, architect, Lindsay Building, is preparing plans for the erection of a bank building to be erected at this place for the Molsons Bank.

Kingston, Ont.

[illegible] leville, will shortly discuss with the Board of Trade a scheme for the erection here of [illegible]

London, Ont.

[illegible] by fire on the 8th inst. Estimated loss [illegible]

Lloydminster, Sask.

[illegible]

Lethbridge, Alta.

[illegible]

[illegible] east, Winnipeg, Man., will erect a wholesale warehouse and office building, [illegible] by [illegible] feet. Estimated cost, $75,000.

Moose Jaw, Sask.

W. A. Elliott, Brandon, Man., has been instructed to prepare plans for a $20,000 warehouse for Ald. Welch. The building will be three storeys high, with a frontage of [illegible] feet.

Montreal, Que.

Fire caused $5,000 damage on the 10th inst. to the spice mills of Herron, Leblanc & Company, St. Paul street.

C. F. Hastings & Company, architects, [illegible] Columbus avenue, Boston, Mass., have prepared plans for an extensive cold storage plant to be erected for the Molsons Brewery. The Dominion Bridge Company have the contract for the steel work. The plans can shortly be seen at the Molsons Company's office, 906 Notre Dame street east.

The land and premises of the Lafontaine Club, corner Dorchester and St. Hubert, have been sold to Mr. J. H. Maher at a price of $21,000. The present building will be torn down and in its place an up-to-date apartment house will be erected.

It is stated that Mr. George Gales, of Gales & Company, 481 St. Catherine street west, will erect a large trunk, boot and shoe factory.

It is stated that Hirsch & Sons, 62 McGill street, have bought the corner of St. James and Desrivieres streets, on which, it is understood that they will eventually erect a large building.

It is also reported that H. Kellert & Sons, 351 St. James street, will erect on the corner of St. Catherine and St. Urbain sterets, property recently purchased by them, a large wholesale clothing factory.

The plans for the new Windsor station are undergoing final revision, and it is expected that contracts for the superstructure will be awarded in ample time to allow of the steel and masonry work being started early in March.

An additional hundred rooms are to be added to the Place Viger Hotel, at a cost of about $150,000, while the building of a St. Louis street wing to the Chateau Frontenac at Qeubec is also under contemplation. At Lake Louise chalet fifty bedrooms are to be added, and the dining rooms remodelled at a cost of $65,000, while at Glacier, B.C., a new power fireproof wing is to be added, and a new power plant installed, at a cost of about $97,000. Twenty-five rooms are to be added to the Sicamous hotel, at a cost of about $20,000.

It is reported that Montreal and New York capitalists are behind the purchase of the property at Peel and St. Catherine streets. It is understood a large departmental store will be erected there. Robins, Limited, Toronto, effected the sale.

Messrs. Saxe & Archibald, architects, 59 Beaver Hall Hill, are preparing plans for the erection of a ten storey office building to be erected on St. James street, adjoining the G. T. R. offices, for the Yorkshire Insurance Company, Limited, 55 St. Francois Xavier street.

Tenders close February 16th at the office of Architect David Ogilvie for the construction of the Blumenthal Building, to be erected at the corner of Balmoral and St. Catherine streets.

It is stated that the land and buildings at and near the corner of St. Catherine and Victoria streets, and on McGill College avenue, have been purchased for the purpose of enlarging and extending the Savoy hotel and constructing one of the largest hostelries in the city. The cost will be about $200,000. Mr. Guile, manager.

Nakusp, B.C.

The Canadian Bank of Commerce is building a new branch. Estimated expenditure, $5,000.

North Bay, Ont.

Brunty's large hotel at South River was destroyed by fire on the 7th inst. Estimated loss, $15,000.

Nicolet, Que.

The Hotel Rochette, with stables and sheds, were burned on the 8th inst. Estimated loss, $30,000.

Ottawa, Ont.

The premises of Hugh Carson, leather goods manufacturer, Rideau tsreet, were damaged on the 13th inst. Messrs. Charleson & Duford, owners. Estimated loss on building, $10,000.

Preston, Ont.

It is stated that the Solid Leather Shoe Company, Limited, will locate here. H. Gale Legg is preparing plans for the factory which call for a building 40 by 100 feet, with two storeys. C. E. Hurlbut, manager; Mr. H. Erb, secretary.

Point Edward, Ont.

It is stated that work on the new cement addition to the grain elevator here will commence shortly. Estimated expenditure, $75,000.

Peterboro, Ont.

It is reported that the Canadian General Electric Company contemplate building an extension to either their plant at Toronto, or here. Estimated expenditure, $250,000 to $750,000. F. Nicholls, general manager; N. McLeod, chief engineer of structural department.

Saskatoon, Sask.

Thos. Ryan, a well-known boot and shoe man, is here looking into the feasability of erecting a branch warehouse.

St. John, N.B.

The tenants of the Wright Building have been asked to vacate on the 1st of May, when the building will be thoroughly remodelled for Macaulay Bros., of this city.

Stewart, B.C.

It is possible that McKenzie & Mann may erect a sawmill here in order to secure railway ties for their railway project.

St. Thomas, Ont.

The butter dish factory at Rodney was destroyed by fire on the 11th inst. Estimated loss, $9,000.

Toronto, Ont.

The Nasmith Company will erect a large bakery on the north side of Duchess street between George and Sherbourne.

Victoria, B.C.

Of the permits issued, that for the McCallum block on Douglas street adjoining the Merchants Bank of Canada, calls for the largest outlay, $30,000.

Plans have been prepared and tenders are invited for the erection of a warehouse to cost $10,000 for the B. C. Hardware Company.

Brown & Cooper, the Government street fish dealers, have decided to make an extensive addition to their present quarters.

Vancouver, B.C.

Parr & Fee, architects, have completed all the details for the immediate construction of two large warehouses. A six-storey building of reinforced concrete, covering 80 by 114 feet on Gore avenue, is to be constructed for the Vancouver Ice & Cold Storage Company.

Whitney, Ont.

It is reported that the St. Anthony Lumber Company will erect a large furniture factory here.

Waterdown, Ont.

The large flour mills owned by Alex. Robertson were destroyed by fire on the 8th inst. Loss not stated.

Welland, Ont.

The plans for the erection of the two-storey planing mill, 60 by 250 feet, on the Harper site are ready. Estimated cost, $50,000. R. D. Stewart, of Guelph, is interested.

It is stated that a new company to be known as the General Air Product will be incorporated to utilize the by-product from the Electro Steel Company of Canada, Limited, for the manufacture of oxygen. Their plant, when erected, will be of no small extent.

Winnipeg, Man.

The Vulcan Iron Works have purchased twenty acres of land on Notre Dame avenue, close to the Dominion Bridge Company's plant. It is not their intention to build at present. This summer they will erect a new blacksmith shop on the old site, to cost $30,000.

Gowans, Kent & Company, have secured an option of the fifty feet owned by the John Marrin Company on Market street, where it is stated they will erect a large four-storey warehouse.

The tenants of the property on the northwest corner of Portage avenue and Smith street, have been asked to vacate. This is taken to indicate that the erection of the office building will begin at once. The Sterling Bank is interested.

It is reported that Winnipeg will have in the near future an extensive wire works. Capitalists interested in the project are the leading shareholders in the Imperial Steel & Wire Company, Limited, of Collingwood, Ont., one of them being J. A. Currie, M.P. for North Simcoe. The capacity of the plant will approximate 100 tons of wire daily.

The A. Macdonald Company, it is stated, will build a large brick and stone cold storage warehouse on Market street east. Estimated cost, $40,000.

A building permit was granted to Messrs. Brown & Cooper on Gordon street, for their new brick store and office, $6,000. Contractors, Luny Bros.

Another warehouse covering 100 by 120 feet facing the sugar refinery, is to be constructed by H. B. Cottrell.

It is stated that the southwest corner of Flora avenue and Main street has been purchased by an eastern firm as a site for a factory. J. C. Miller is interested.

J. McDiarmid & Company, contractors, have on hand the construction of a large five-storey building on Princess street, frontage of 110 feet and 120 feet depth to be occupied as western headquarters by the Canada Cycle & Motor Company, Toronto. Local managers, F. H. Luke and B. B. Halliday. Work will commence next month.

AWARDED.

Hamilton, Ont.

The contract for the brickwork for the $1,000,000 extension to the plant of the Hamilton Steel & Iron Company has been awarded to Geo. F. Wobb, Hamilton.

Montreal, Que.

J. Rosson Gardner, architect, New York Life Building, has awarded the contract for alterations to the premises of Downing Brothers, at the corner of Queen and Ottawa streets, to E. B. M. Cape.

Winnipeg, Man.

Architect Frank Evans, this city, has awarded the following contracts for a five-storey warehouse to be erected in Winnipeg for the Paulin Chambers Company, Winnipeg, viz.: General contract, Phil. Burnett, Winnipeg; iron work, Manitoba Iron Company, Winnipeg. The building will be 50 by 125 feet, of mill construction and will cost $30,000.

Power Plants, Electricity and Telephones

Bracebridge, Ont.

Tenders are being called by A. C. Salmon, town clerk, for the erection of Wilson's Falls power house until February 21st. Plans, etc., at office of town clerk.

Fredericton, N.B.

A company to be known as the Fredericton Street Railway Company will make application to the Legislature for a charter. Solicitor, R. B. Hanson.

Hope, B.C.

The Fraser River Lumber Company will apply on the 23rd inst. for sanction to divert water for generating electricity and other power for light, heat, power, operation of motors, engines and all machinery. A D. McRae, president. Noted in last issue as relating to Fraser River Land Company.

Hull, Que.

Tenders addressed to J. F. Boult will be received until February 21st for the construction of an addition to the Corporation Power House, Brewery street. Plans, etc., at office of R. W. Farley, city engineer.

Niagara Falls, Ont.

It is likely that the electric railway line from Queenstown to Niagara-on-the-Lake will be extended. Superintendent Martin Sheehan of the Intercolonial Railway and Mayor James Aikens are interested.

Ottawa, Ont.

A bill to incorporate the Ottawa and Montreal Power Transmission Company will be presented to the House of Commons. Authority will be sought to transmit power in the counties of Wright and Pontiac, etc., and to Montreal. Capitalization, $500,000. Incorporators, Cameron Edwards, J. B. Fraser, R. G. Edwards and R. Blackburn, all of Ottawa.

Renfrew, Ont.

A bylaw to raise $77,000 for the erection and development of a municipal power plant will be submitted to the ratepayers in the near future.

Shelburne, N.S.

M. S. Robertson, town clerk, has invited tenders for $20,000 electric light debentures.

Sherbrooke, Que.

We have been informed that the St. George Electric Company, of this city, will build a new concrete dam and electric plant on the Chaudiere river. Probable expenditure, $75,000. J. W. Gregoire, secretary-treasurer.

Toronto, Ont.

Two tenders for construction work in connection with the electrical conduit system were received. Prices were as follows: $1,740, $2,200. On the recommendation of the City Engineer, the work will be carried out under his supervision by day labor. Estimated cost, $1,500.

Victoria, B.C.

The Pacific Radio Company have purchased a site on Smith's Hill for the tower which they will erect.

Miscellaneous

Calgary, Alta.

The ratepayers will vote on a $242,000 bylaw for waterworks extensions and, a $20,000 subway bylaw.

Exeter, Ont.

The town has sold $8,365 local improvement debentures.

Montreal, Que.

Tenders addressed to L. K. Jones, secretary, Department of Railways and Canals, will be received until February 22nd for improving approach to St. Gabriel locks. Plans, etc., at office of Chief Engineer of Department of Railways and Canals, Ottawa, and at office of Superintending Engineer of the Quebec canals, No. 2 Place d'Armes, Montreal.

Recent building permits include: Hall Bros., 67 Bleury street, warehouse, $6,000; A. Lacroix, 479 Mount Royal avenue, house containing store and dwelling, $3,500; V. Lamoureux, 1273 St. Catherine street east, one house containing two dwellings, $2,000; J. T. Davis, 212 Drummond street, one dwelling, $6,000; Mrs. A. Paquette, 1239 St. Hubert street, one house containing two dwellings, $2,500; St. Aloysius Parish, 2017 St. Catherine street east, one house, $10,000; Thos. Girard, 360 St. Catherine street east, one house containing three dwellings, $3,000; Jos. Jacob, 115 Convent street, one dwelling, $7,000; Chas. Cushing, alteratione to dwelling, $3,000; L. Labonte, 16 Robillard street, house containing three dwellings on Nicolet street, $3,000; Jos. Girard, 566 St. Germain street, house containing three dwellings on St. Germain street, $3,000; Theo. Menard, 342 Laurier avenue, two houses containing four dwellings on St. Andre street, $5,000; Z. Cote, 39a Garnier street, one-storey house on St. Dominique street, $2,000; Alf. Lacomb, 640 Albani street, alterations to property on Albani street, $1,000.

Peterboro, Ont.

The Board of Works recently discussed the question of purchasing the years' supply of cement, but took no action. Offers should be addressed to Ald. Hicks.

Revelstoke, B.C.

F. C. Gamble, provincial engineer, has given instructions for the laying of a mattrass along the east bank of the Columbia river, from the C. P. R. bridge to Big Eddy, to protect the bank from further erosion. Cost, $50,000.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman, Board of Control, will be received until February 21st for oil switches. Specifications at the [illegible] Department, City Hall.

Victoria, B.C.

The McLaughlin Buick Company will [illegible]

Vancouver, B.C.

[illegible] roller for Stanley Park: Macfarland & [illegible]

$3,450; Harris & Company, $3,360; and Mussen & Company, $3,700. A committee was appointed to consider the lowest tender, and accept it if satisfactory all through.

A building permit was recently issued for a warehouse, corner of Homer and Drake streets, with trackage, to Messrs. Macpherson & Teetzel, wholesale building material merchants, and is estimated to cost $25,000. Other permits wer granted as follows: A. A. Heitz, 2104 Venables street, $2,500; W. H. Critz, Grant street, $2,250; Geo. Russell, dwelling, Richardson street, $3,000; S. McLellan, 2237 Victoria drive, $2,500; C. J. Church, 2060 York street, two houses, $6,000.

Winnipeg, Man.

The Board of Control at Winnipeg are calling for tenders for the supply of railway asphalt plant. For further particulars, see advertisement in this issue.

Tenders addressed to the chairman of the Board of Control, will be received until February 23rd for the supply of three "Squee-Gee" street washing machines, with one spare roller. Specifications, etc., at office of the street commissioners, City Hall. M. Peterson, secretary.

AWARDED.

Hamilton, Ont.

The Canadian Cement Company has been awarded a contract by the city for all the cement required during the year.

The following contract for annual supplies have been awarded:—Cement, Canadian Portland Cement Company, $1.50 a barrel, 26 cents more than last year; lumber, M. Brennen & Sons Company, $27.75 per 1,000 feet; sewer brick, Ollman Bros., on an average of $8.25 per thousand; lime, E. J. Guest, 16 cents per bushel; sewer pipe, Toronto and Hamilton Sewer Pipe Company; hydrants, Canada Foundry Company, 150 hydrants at $43.12 each; castings, Gartshore Thomson Company, $2.05 per hundred; iron pipe, Gartshore Thomson Company, $34 per ton; gate valves, Kerr Engine Company, of Walkerville, $9 each for 6-inch valves and $36 each for 12-inch valves; pig lead, Adam Hope & Company, $3.53 per hundred pounds; lead pipe, Canada Metal Company, $4.35 per hundred pounds.

Montreal, Que.

It is stated that the Canada Cement Company has been awarded the contract for the supply of cement required for the construction of the Quebec bridge.

It is stated that the Dominion Bridge Company has been awarded the contract for the steel work on a million and a quarter dollar building to be erected in Winnipeg this year; also for the Calgary power plant at Exshaw and the Carnegie Library at Calgary.

Ottawa, Ont.

The Department of Public Works at Ottawa has awarded the contract for a twin [illegible] to the Polson Iron Works, of Toronto, at $8,175. The amount of contract awarded to W. H. Kelly for one light draught tug was $7,500. Noted in issue of January 26.

Shelburne, N.S.

[illegible] involving $25,000.

Toronto, Ont.

[illegible] for an automobile for the Chief of the Fire Department, as follows: 30 to 40 h.p., $2,450; 30 to 35 h.p., $2,050; 40 h.p., $2, [illegible]

(Continued on page [illegible])

Tenders and For Sale Department

Extension of Time

Tenders for
Gaol Heating

Tenders will be received by the undersigned up to noon on WEDNESDAY, the 23RD DAY OF FEBRUARY, for the heating of the County Jail at the Town of Barrie, according to plans and specifications which may be seen on application to A. W. Beardsley, County Clerk's Office, Court House, Barrie. All tenders to be sealed and marked "Tenders for Gaol Heating" and addressed to

C. J. PICOTTE,
Chairman County Property Committee
Box 128, Penetanguishene, Ont.

City of Moose Jaw

Notice

Tenders will be received for two (2), two-horse street sprinklers, steel tanks.

Tenders stating capacity and weight, giving prices f o.b. Moose Jaw, to be laid on the council table not later than 8.30 p.m., on MONDAY, FEBRUARY 21st., 1910.

THE CITY OF MOOSE JAW
W. F. Heal, City Clerk.

7

TOWN OF ORILLIA

Province of Ontario

Sealed tenders will be received by the Town Clerk until 8 p.m. on MONDAY, MARCH 7TH, 1910, for

Sewage Pumping Machinery

comprising Gasoline Engine, Electric Motors and Centrifugal Pumps.

Plans and specifications may be seen at the office of the Chief Engineer, Mail & Empire Building, Toronto, or Resident Engineer's Office, Orillia.

No offer necessarily accepted.

W. C. GOFFAT, Esq.,
Mayor
Orillia, Ont.

C. E. GRANT, Esq.,
Town Clerk
Orillia. Ont.

WILLIS CHIPMAN, C. E.,
Chief Engineer,
Toronto, Ont.

7

Tenders

The University of Saskatchewan will shortly call for tenders for the

College Building, Students' Residence Power House, Live Stock Pavilion, Agricultural Engineering Building, Horse Barn and Cattle Barn

Those interested should communicate with the architects, BROWN & VALLANCE, Canada Life building, St. James St., Montreal, or PRESIDENT MURRAY, University of Saskatchewan, Saskatoon, Sask.

7

Debentures For Sale

Sealed tenders will be received up till noon WEDNESDAY FEBRUARY 23RD, 1910, for the purchase of $7,500.00 Local Improvement Debentures of the Town of Oshawa. dated December 20th, 1909, bearing interest at 4½% per annum and payable at the Office of the Treasurer, Oshawa, in 20 equal annual payments of $570.57 of principal and interest.

Also, for the purchase of $2,500.00 Local Improvement Debentures of the Town of Oshawa, dated December 7th, 1909, hearing interest at 4½% per annum and payable at the Office of the Treasurer, Oshawa, in 30 equal annual payments of $153.50 of principal and interest, accrued interest to be paid by the purchaser.

The highest or any tender not necessarily accepted

THOS MORRIS,
Town Clerk.

7

City of North Vancouver

Debentures for Sale

Sealed tenders addsessed to the undersigned and marked "Tender for Debentures," will be received up to 5 o'clock p.m. on MONDAY, THE 28TH DAY OF FEBRUARY, 1910, for the purchase of the following general debentures of the Corporation of the City of North Vancouver:

WATERWORKS	$ 65,000
SEWER	40,000
SCHOOL	16,000
ROAD MACHINERY	10,000
PARKS	5,000
FIRE EQUIPMENT	3,000
	$139,000

Repayable 17th January, 1960. Interest 5 per cent., payable half-yearly on 17th January and 17th July in each year.

Tenders will be received for the above debentures en bloc.

The highest or any tender not necessarily accepted.

Copies of the by-laws and other information may be obtained on application being made to the City Clerk, North Vancouver, B. C.

THOMAS SHEPHERD,
City Clerk.

City Hall, North Vancouver, B. C.
January 19th, 1910.

7

County of Perth

Competitive Designs for New Registry Office.

Competitive Designs for a new Registry Office in the City of Stratford, will be received by Wm. Davidson, County Clerk, on behalf of the County Property Committee, up to one o'clock p.m., MARCH 1ST, 1910.

The building to be 34 x 50 feet, one story with basement. Outside walls to be of white stock brick basement of best St. Marys stone. Cost not to exceed $10,000.00, including steam heating.

The plans showing the greatest efficiency in fire-proof construction and general design will be accepted when approved by Government Inspector. Plans not accepted will be returned. The architect whose plans are accepted will be required to prepare specifications, detail drawings, etc. A short description of general construction of the building to accompany plan.

Any further information can be obtained by communicating with the County Clerk.

WM. DAVIDSON,
County Clerk,
Stratford P.O,

ROBERT ARMSTRONG,
Chairman of Committee.

Stratford, February 1st, 1910.

7

To Contractors

The Amalgamated Asbestos Corporation, Limited, is prepared to receive tenders for the removal of about 60,000 cubic yards of gravel and clay from the surface of one of their properties at Black Lake. Full specifications can be had at the Company's office, Room 602, Eastern Townships Bank Building, No 263 St. James St., Montreal.

The company reserve the right to reject any or all tenders and does not bind itself to accept the lowest.

R P. DOUCET,
Secretary-Treasurer

7

Tenders for Supply of Asphalt

Sealed tenders, addresed to the Chairman, Board of Control, for the supply of from 2,500 to 3,500 tons of Asphalt for street paving for the City of Winnipeg, will be received at the office of the undersigned up to 11 a.m. on FRIDAY, FEBRUARY 25TH, 1910.

Specifications and forms of tender, together with conditions governing tenders as prescribed by By-law may be obtained at the office of the City Engineer, James Street Winnipeg. The Board reserves the right to reject any or all tenders or to accept any bid which appears advantageous to the City.

M. PETERSON,
Secretary.

Board of Control Office, Winnipeg, Jan. 31st, 1910.

To Contractors

Sealed bulk or separate tenders endorsed "Tender for addition to Ontario Parliament Buildings" addressed to the undersigned, will be received at this department until noon on

Tuesday, the first day of March, 1910

for the following works, viz.: Masonry, bricklayer, cut stone, carving, fireproofing, etc.; structural steel; steam heating; plumbing and gasfitting; iron armored conduit and electric wiring; vault doors; roofing, copper and sheet metal; carpenter work; ornamental iron and grille work; elevators; lathing and plastering; painting and glazing; marble and tile; metallic fire-proof doors, base and trim; hardware; iron-founders work; required in connection with the extension to the Ontario Government Buildings, Queen's Park. Plans and specifications may be seen at the office of Geo. W. Gouinlock, Architect, 1108 Temple Building, Toronto.

An accepted bank cheque payable to the order of the Honorable, the Minister of Public Works for five per cent of the amount of the tender and the bona-fide signatures and addresses of two sureties or the bond of a Guarantee Company approved by this Department prepared to give a bond for the due fulfillment of the contract must accompany each tender. Cheque will become forfeit to the Crown in the event of the successful tenderer refusing to carry out the work within ten days after the acceptance. The Department will not be bound to accept the lowest or any tender.

J. O. REAUME,
Minister of Public Works, Ontario

Department of Public Works, Ontario.
Toronto, February 4th, 1910.

(Newspapers publishing this advertisment without authority will not be paid for it.)

8

Factory For Sale, Rent or Exchange

1 storey, light, three-sides, 3,500 square feet floor space. Prominent corner on Queen Street, five minutes from Youge Street, Toronto. Address Box 920, CONTRACT RECORD, Toronto. 9

Tenders for Supply of
Railway Asphalt Plant

Sealed tenders addressed to Chairman of the Board of Control, Winnipeg, for supply of Railway Asphalt Plant, complete and tested for operation, will be received at the office of the undersigned up to 11 A. M., on TUESDAY MARCH 1ST 1910. Specifications and forms of tenders, together with conditions governing tenders as prescribed by By-Law, may be obtained at the office of the City Engineer, Winnipeg.

The lowest or any tender not necessarily accepted.

M. PETERSON
Secretary

Board of Control Office, Winnipeg, Feb. 9th, 1910. 7

For Sale

A 60,000 gallon Water Tank on Steel Trestle, 90 ft. high.

Sealed tenders addressed to the Chairman of the Water Works Committee, endorsed "Tender for Water Tank", will be received by registered post only up to 5 p.m. TUESDAY, MARCH 1ST, 1910, for the purchase removal of a 60,000 Imperial Gallon Wooden Tank and mounted on a steel trestle, 90 ft. high, at the Ottawa East Pumping Station.

Particulars may be obtained on application to the City Engineer's Office, City Hall, Ottawa.

The Corporation does not bind itself to accept the highest or any tender.

NEWTON J. KER,
City Engineer.

Ottawa, January 25th, 1910. 7

Temiskaming and Northern Ontario Railway Commission

Tenders for Grading

Sealed tenders, addressed to the undersigned, and marked "Tenders for Grading" will be received up till 12 o'clock noon, on MONDAY, FEBRUARY 28TH. for all and every kind of labor, tools, machinery, and other plant, services and material whatsoever necessary for the due execution and completion of, in a thorough and workmanlike manner, all the grubbing, grading, embankment protection, clearing and culverts necessary for the construction of a cut-off on the Main Line of the Temiskaming and Northern Ontario Railway, between M.P. 60 and M.P. 61.

Plans and specifications may be seen at the office of the Commission, 25 Toronto Street, Toronto, and the office of the Chief Engineer, North Bay.

Certified cheque on a chartered bank, payable to the order of the Secretary-Treasurer of the Commission for $500.00 must accompany each tender.

Tender must be made out on form supplied by the Commission.

Deposit cheque of unsuccessful tenderers will be returned.

Successful tenderer's deposit cheque to stand as security for immediate execution of construction contract, and then to be held, together with further security by bond satisfactory to the Commission, for the due performance of the contract.

Commission will not be bound to accept the lowest or any tender.

A. J. McGEE, Secretary-Treasurer,
25 Toronto Street, Toronto, Ont.

Toronto, February 8th, [illegible]

Papers inserting this advertisement without authority will not be paid for same. 8

Tenders Wanted

Tenders will be received by the undersigned, until FRIDAY, MARCH 4TH, at 12 o'clock noon, for the erection and completion of a Sabbath School building in connection with the Welland Presbyterian Church, and also for certain modifications in the present church as per plans and specifications, which may be seen at W. H. Crowther's store, North Main street, Welland, on and after Thursday, February 10th, 1910. Tenders to be as follows: (1) Bulk tender for whole work as described in plans and specifications; (2) Separate tender for Sabbath School building alone.

No tender necessarily accepted.

ALEX. ASHER,
8 Secretary, Bd. of Managers.

Notice to Contractors

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, up to noon, on TUESDAY, FEBRUARY 22, 1910, for a 42-inch hydraulically operated Stop Valve.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications may be seen and forms of tender obtained at the office of the City Engineer, Toronto.

The usual conditions relating to tendering as prescribed by city by-law must be strictly complied with or the tenders will not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY, (Mayor),
Chairman Board of Control.

City Hall, Toronto, February 8, 1910. 7

Miscellaneous

Fine Factory Site—New Westminster, B. C., the coming factory city Lot 7. Block 36; corner 198 x 132 three frontages; close to tracks and waterfront Right in city, and already surrounded by industries. $15,000 Snap. Will bring double this inside two years. Investigate. Address P. O. Box 516, Vancouver—owner

Miscellaneous

(Continued from page 27

to 40 h.p., $2,452. The contract was awarded to the McLaughlin Carriage Company, Limited, at $2,470.

Victoria, B.C.

The contract for [illegible] has been awarded to the Victoria Machinery Depot Company.

Vancouver, B.C.

The secretary-treasurer, North Vancouver City Ferries, sends us the list of the following tenders for construction of ferry steamer: Wallace Shipyards, Limited, North Vancouver, B.C., for 6 months' construction, one set engines, $114,927; two sets engines, $117,927; for 7 months' construction, $13,427, $116,427; for 8 months' construction, $111,,907, $111,927. Colin F. Jackson & Company, Vancouver, B.C., for delivery, February, 1911, one set engines, $133,632; two sets engines, $132,217. Brit[illegible] Victora, B.C., for 44 weeks' construction, [illegible] Messrs. Wallace Shipyards, for delivery August 1st, 1910, double engines for $117, [illegible]

Winnipeg, Man.

The Board of Control have accepted the tender of Max Baranisky of this city for [illegible] 50 carts for dust cans at $8.95 each was also accepted. The combined tenders are only about half what was asked by other tenderers for similar equipment.

New Companies

The Canadian Dart Company, Montreal, Que., capital $50,000, incorporated to carry on the business of a general construction and contracting company in all its branches. Incorporators: W. Dart, C.E., F. H. Jefferson, engineer, A. E. Cambridge, engineer, and W. H. Brunning, architect, all of Montreal.

Riordon Paper Company, Limited, Montreal, Que., incorporated, capital $6,000,000. Incorporators: Gordon Walters MacDougall, K.C., L. Macfarlane and C. A. Pope, advocates, all of Montreal.

The Canada Slate Company, Limited, Toronto, incorporated, capital $500,000. Incorporators: F. L. Hutchinson, accountant, A. N. Morgan and M. F. Pumaville, barristers, and others, all of New Liskeard, Ont.

Instanter Company, Limited, Toronto, capital $50,000, incorporated to carry on the business of plumbers and gas fitters. Incorporators: J. H. Spence and M. Brooks Cameron, barristers, both of Toronto.

The Central Canada Power Company, Montreal, Que., incorporated, capital $5,-000,000. Incorporators J. C. Hickson, K.C., S. B. Hammond and V. M. Drury, accountants, G. Casimir Papineau-Couture, advocates, all of Montreal, Que.

The Holland Varnish Company, Limited, Montreal, Que., incorporated, capital $100,-000. Incorporators: G. C. Greenshields, E. R. Parkins, advocates, both of Montreal, Que.

L. E. Labrecque, Limited, Quebec, Que., capital $49,000, incorporated to carry on business in construction materals, etc. Incorporators: Messrs. Leonidas E. Lebrecque, merchant, Quebec, and R. Giguere, plumber, Levis, Que.

Telectron Company, Limited, Ottawa, Ont., capital $40,000, incorporated to manufacture electrical instruments, etc. W. Metcalfe, merchant, Ottawa, is interested.

Kingston Shipbuilding Company, Limited, Kingston, Ont., incorporated, capital $500,000. Incorporators, W. J. Fair, H. A. Calvin and J. McKelvey, all of Kingston; J. M. Smith, Collingwood; Simon Dyment, Barrie, and A. McDougall, Duluth, Minn., U. S. A. (president of the Collingwood Shipbuilding Company).

Munn Lumber Company, Limited, Orillia, Ont., incorporated, capital $100,000. Incorporators: J. B. Tudhope, W. H. Tudhope, crariage makers; A. E. Munn and H. J. Bartlett, lumbermen, all of Orillia.

Renfrew Machinery Company, Limited, Renfrew, Ont., incorporated, capital $250,-000. Incorporators: R. Handley, accountant, W. T. Guest, T. Logan, managers, and E. J. Stewart, barrister-at-law, all of Renfrew.

Fletcher Pulp & Lumber Company, Limited, Sherbrooke, Que., incorporated, capital $300,000. Incorporators, C. H. Fletcher, gentleman, R. A. Ewing, R. H. Fletcher [illegible] man, Portland, Maine, U. S.

[illegible] Ont., capital $10,000, incorporated to [illegible] "Fred Homes & Sons." Incorporators: F. Holmes, contractor; C. R. Holmes and [illegible] Holmes, builders, all of Toronto.

Making "Y" and "T" Joints for Straight Concrete Sewer Pipe

The making of T's, Y's and connections and other special pipes is, like all other parts of the cement pipe business, a very simple matter when you. understand how to go about it. We give herewith the different steps to be taken in making special pipe, and if you follow these simple instructions, you cannot go wrong.

These special shapes always sell at a very handsome profit, and require no extra investment on your part to make them. They are made from regular stock pipe constructed on your regular sewer pipe moulds. In the sewer pipe market a T or Y joint usually sells at from two to four times the price of a regular length of the main pipe. You have no extra investment in equipment and the only extra cost to you is the labor of making, which is a small matter.

Extreme care should be used in these operations. While a concrete pipe is not as easily broken as a vitrified clay pipe, at the same time, if you go at it with a sledge hammer and strike heavy blows, you will break it to pieces; but, if you will be careful, you will experience no breakage in making this special pipe.

By way of an illustration: Supose you wish to make a T joint for joining a 10-inch sewer pipe to a 24-inch main sewer. For this purpose you should have some pieces of 10-inch pipe, made not over 12 inches in length—that is, 12 inches above the bell. Select a good, sound, well tamped 24-inch pipe from your stock that is two or three weeks old. It will cut best at this time, but can be cut at any time and at any age. Bed the large pipe in sand, so as to keep it from rolling, and give it a soft bed to lie in, take the small section of pipe to be joined to it, cut it so that the end of it will fit the outer shell of the large pipe at right angles. Set the small pipe on the large pipe and with a pencil or sharp instrument, describe the circular line on the outside of the large pipe around the end of the small pipe, where you wish to cut the hole. Wet the large pipe thoroughly, then, with hammer and chisel, cut a line around the hole you wish to make about half an inch inside of the line that you have drawn. Keep on cutting carefully until you get about half way through the pipe all the way around, then cut the balance of the way through in three or four places about half way around the hole, and tap the piece gently from the inside, and the piece will come out easily, just where it has been cut.

Now trim or rim out this hole with a chisel until it fits the pipe that you wish to insert. After this hole has been trimmed so the small section will slide in easily, wet the end of the small pipe to be joined and the large pipe where it has been cut thoroughly, and go over it with a solution of neat cement of about the consistency of thick cream, a small brush being used. Then insert the small section of pipe in the opening where it is to be joined to the large pipe and brace from the inside so as to hold it in position, being careful that the end of the small section does not project beyond the inside of the shell of the larger pipe. After this has been firmly braced in position, mix up a cement mortar so it will handle easily with a trowel, about one part of cement and one part of fine sand, and fill around the junction. This junction at the angle where the two outside surfaces meet can be built up and strengthened in this manner with cement mortar to give any required strength, and it really becomes the strongest part of the pipe.

This joint is then wiped with a solution of neat cement, the same as was used at the start, the same as a plumber wipes a lead joint. In this manner a very strong and durable, as well as neat-looking, pipe is produced.

The next day the braces from the inside can be removed and the inside plastered, the same as the outside has been, with a rich cement mortar, and the inside made perfectly smooth by the use of the solution of neat cement and water applied with a small brush. Ordinary care will result in smooth, clean, strong joints, and the margin of profit in these special forms makes the extra labor worth while. The same method is used for making a Y joint as for making a T joint.—Concrete.

Cement and Concrete Association Convention

It has been decided to hold the annual convention of the Canadian Cement and Concrete Association at London, Ont., March 29-April 1. Special committees have been appointed and there is every indication that the convention will be a great success. A delegate is being sent to the convention of the American Concrete Association, held in Chicago this month, in the interests of the Canadian association.

The Princess rink at London has been secured and applications for space have already been sent in. The president of the Canadian Cement Association is Professor Gillespie, of Toronto University. The vice-president is Mr. Gustav Kahn, of the Trussed Concrete Steel Company, Toronto. The chairman of the Finance Committee is Mr. C. T. Pulfer, manager of the Ideal Concrete Machinery Company, London. Mr. R. E. G. Haggerty, of Toronto University, is the acting secretary.

After interviewing Mr. Pulfer in London last week, the "Contract Record" representative went away with big ideas in regard to the coming convention. Mr. Pulfer expects a representative gathering from the States and expects the convention to be away ahead of the one in Toronto last year. Complete details will be published in a later issue.

A. W. Campbell Suggests "Skilled Inspectors"

At a dinner of the University of Toronto Engineering Alumni Association, on Thursday, Feb. 11th, Mr. A. W. Campbell emphasized the fact that there is great need in Canada to-day for skilled inspectors who will act as the connecting link between the designing engineer and the contractor in the construction of public works. Deplorable waste and extravagance was the result of municipalities engaging laymen. To the layman, the architect or engineer was apt to be a man of fanciful ideas, who could write long specifications and draw more or less intricate pictures. Towns and cities were frequent offenders in the matter of inspection, and the inferior results and failures in some municipal improvement works throughout the province were due to the employment of untrained inspectors. The public were slow to grasp the value of expert services, and it was only through the blunders of unskilled men and costly experience that these matters would adjust themselves.

Mr. Campbell said he was not speaking in the interests of technically trained men. As a public official, charged with the handling of public funds, he had reached those conclusions from years of experience, and deemed it but right that he should give the public the benefit of his experience, and warn them in the interest of good workmanship and economy. Contractors, however honest, were chiefly concerned in the profits accruing, not in the perfection and durability of the work, and it might be accepted as an axiom that the quality of the work could not be left wholly to the contractor.

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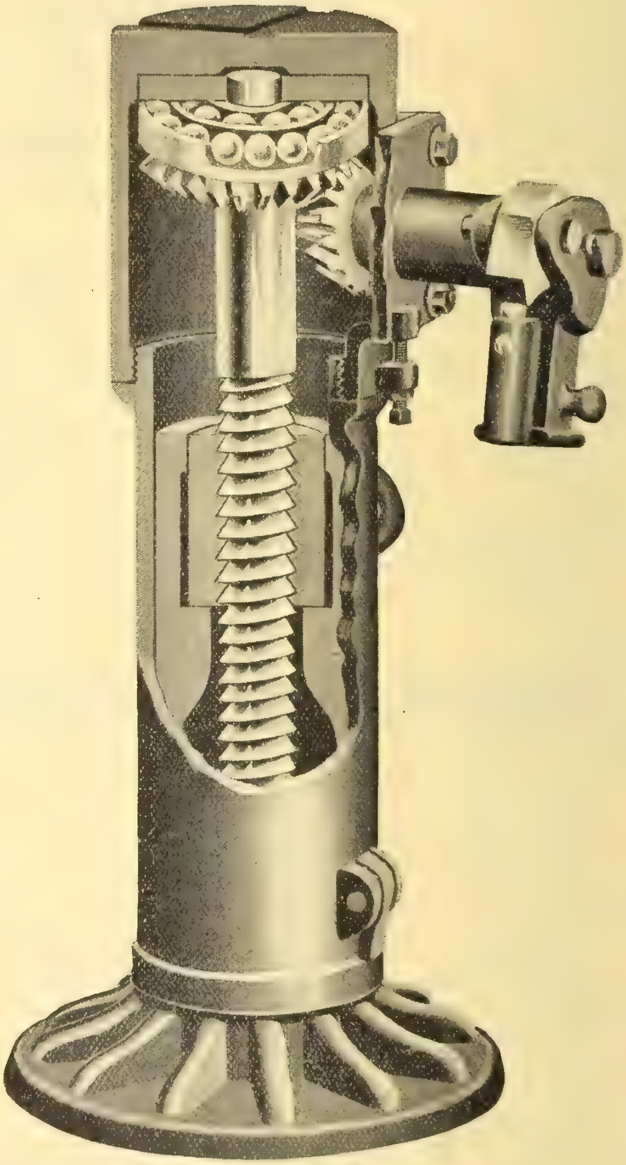

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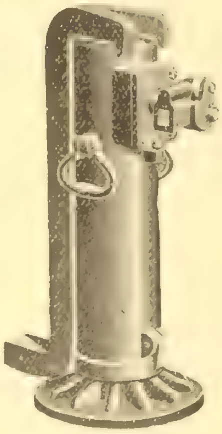

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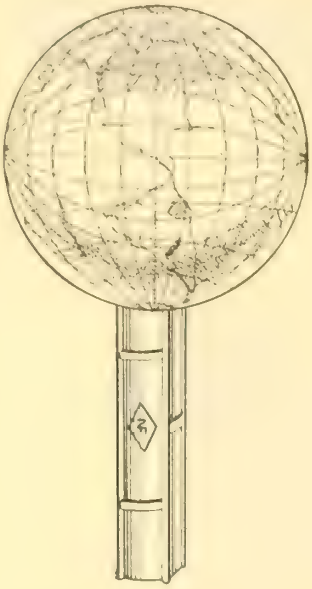

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ESTABLISHED 1886

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Of Vital Interest to Contractors

In this issue is published a complete report of the builders' convention at London, Ont., last week. The matters discussed were of vital interest to the contracting fraternity and we would suggest that those of our readers who were not present at the meeting study the proceedings carefully and communicate to us for publication their views upon any subject with which they may happen to be particularly concerned.

Apropos of improvement in the present conditions of contracting, the suggestion is made that in every instance where time is the essence of the contract and a penalty is imposed, it shall be incumbent to stipulate a bonus equal to the amount of the penalty, so that contractors may have an equitable inducement to put forth their best efforts. An argument in favor of this system is that in every case where it has been employed it has worked out satisfactorily. It is reasonable to suppose that if such a provision were more general in penalty contracts, there would be better results and probably less litigation.

Subscribing by Wire

It is a source of much gratification to us to be able to state that never before in our experience as publishers have we been rewarded with such practical encouragement as during the past few months. Never before in a similar period have we had the pleasure of entering so many new subscribers to the "Contract Record," and certainly in no other period of like duration have we had so many satisfactory reports from our advertisers as to enquiries [illegible] performing a well defined function quite apart from its advance information and editorial matter. It is a somewhat uncommon experience to have subscriptions wired in, but this is what happened the other day. A telegram received at this office was as follows:

Saskatoon, Sask., Feb. 8.
"Contract Record,"
Toronto.
Enter our subscription and forward latest copies.

In nearly every sphere of human endeavor, the measure of success is gauged by the practical evidence of appreciation forthcoming. And the publishing field is no exception. It could not be hoped—indeed it would be useless to try—to fulfil the letter of every individual requirement, but by the close association of ideas, by studying carefully the developments of the field, and with a certain amount of foresight it is possible to maintain the interest of the minority and to render a service that is practically indispensable to the majority. *Results* are what count—and these we are accomplishing.

To the many friends of this journal, who, in the past, have manifested such a gratifying interest in the work, we offer our best thanks, with confidence in their continued good will. To our new subscribers we extend a warm welcome, with a request for that personal co-operation which shapes the destiny and ensures the success of that for which it is put forth.

Another Echo of the Quebec Bridge Affair

[illegible] the Quebec Bridge [illegible] the Government was outwitted in its dealings with the Phoenix Bridge Company, the corporation which was engaged on that ill-fated structure. The Government thought the contract was with the famous Phoenix Iron Company, of Philadelphia, but found, when it came to investigate the question of responsibility, that the contract was with a subsidiary company with a capitalization of only $50,000. To this company some $3,000,000 was paid. The bridge fell down, and there is little hope of anything being realized. About the bond of $100,000, which the company deposited as security, technical difficulties have arisen, and no payment has been made as yet. It seems almost incredible that on work of such a magnitude as this the Government should be in such an obscure position. Under such administration, can it be wondered at that tendering on public works is so unsatisfactory, that graft is rife and that bridges collapse? It is to be [illegible] and take a timely hint from the unsavory publicity that has developed in the connection stated.

[illegible] a certain amount of leniency. Occasionally, nevertheless, the limit of passive endurance is almost exceeded. [illegible] the Toronto "Globe" published an advertisement inviting applications for the position of city engineer of Victoria, B.C., stating that the job was worth [illegible]

Fourth Annual Convention of the C.N.A.B.

Enthusiastic Gathering of Master Builders at London, Ont.—Complete Account of Important Deliberations—Next Convention to be Held at Winnipeg

In point of enthusiasm, attendance, good practical discussions and important resolutions, the fourth annual convention of the Canadian National Association of Builders, which was held at London, Ont., on Feb. 8th and 9th, was one upon which the executive and members of the Association may well be satisfied. Our assertion in regard to the attendance will be supported by the following list, which is an abbreviated schedule of these who signed the register.

A. Dinnis, Toronto.
Fred Armstrong, Toronto.
Geo. Oakley, Jr., Toronto.
J. W. Aldridge. Toronto.
Edward Gearing, Toronto.
A. P. Steward, Toronto.
Wm. Pears, Toronto.
John Wickett, Toronto.
P. L. Fraser, Toronto.
T. E. Cannon, Jr., Toronto.
Chas. Bulley, Toronto.
Harry Jennings, Toronto.
Geo. Gander, Toronto.
J. H. Lauer, Montreal.
Thos. Gilday, Montreal.
W. E. Ramsay, Montreal.
D. J. MacKenzie, Ottawa.
W. J. Adamson, Ottawa.
Aug. Boehmer, Ottawa.
James Ritchie, Ottawa.
G. A. Crain, Ottawa.
W. A. Rankin, Ottawa.
E. T. Nesbitt, Quebec.
Chas. S. Shipman, Winnipeg.
James A. Payne, Winnipeg.
J. W. Morley, Winnipeg.
John Jones, London.
Samuel Willis, London.
H. W. Magee, London.
F. J. Rumble, London.
Wm. Geary & Sons, London.
Geo. A. Kernohan, London.
I. Sargent, London.
Thos. Copp, London.
L. A. Boss, London.
L. R. Folley, London.
Thos. Redge, London.
W. T. Pace & Son, London.
H. Stratfold, London.
W. C. Mortimer, London.
I. Quick & Son, London.
Thos. Beer, London.
John Maker, London.
Wm. Chamberlain & Sons, London.
J. Evans & Son, London.
J. A. Matthews, London.
Wm. Warner, London.
W. T. Brown, London.
L. H. Martyn, London.
Wm. C. Northey, London.
Walter Dann, London.
R. H. Smith, London,
Chas. Dyson, London.
W. J. Nutkins, London.
John Nutkins, Sr., London.
C. H. Gould, London.
Geo. S. Gould, London.
T. R. Wright, London.
Geo. C. Young, London.
John Whittaker, London.
W. Tytler, London, Ont.
Ex-Mayor S. Stevely, London.
Ex-Ald. D. Ferguson, London.
Thos. Wilkey, London.
E. R. Dennis, London.
A. E. Nobbs, London.
John Moran, London.
Wm. Jeffery, London.
Geo. H. Belton, London.
Scott Murray, London.
John Putherbough, London.
C. Colerick, London.
L. J. Odell, London.
F. McWaine, London.
Thos. Jones, London.
Wm. Gray, London.
M. J. Irwin, London.
A. J. Cromer, Brantford.
G. W. N. Day, (Contract Record).
F. W. Scherbarth, (Contract Record).

The business sessions of the convention were held in the commodious quarters of the London Builders' Exchange, in the Bank of Nova Scotia Building. The local secretary, Mr. Geo. S. Gould, in his own unostentatious fashion, worked hard from start to finish to make the delegates feel at home in the Forest City and to ensure the success of the convention.

Tuesday, February 8th

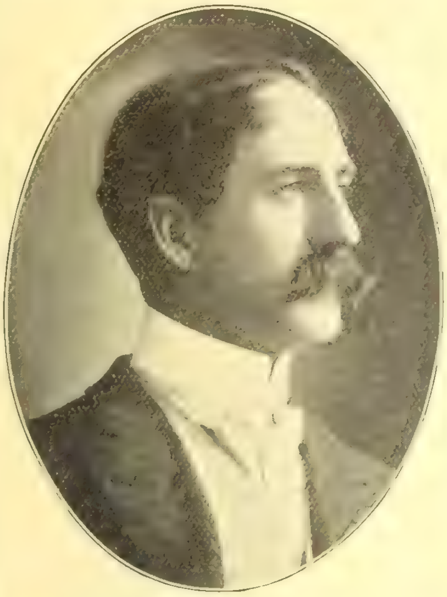
After the delegates had registered they were called to order by Mr. Geo. A. Crain, of Ottawa, president of the Association. In the absence of the Mayor, Aldermen Eckert and Stevenson extended the freedom of the city to the visitors. In reply to these speeches ex-Ald. Donald Ferguson, who was in a particularly happy vein, thanked the aldermen on behalf of the Association. Mr. Wm. Tytler, of the London Builders' Exchange, also welcomed the visiting delegates, saying in part:

I am sure we are all particularly pleased to see represented here for the first time the building contractors of the city of Toronto, and I trust that the time is not far distant when the

Mr. E. T. Nesbitt, of Quebec, the New President.

Mr. J. W. Morley, of Winnipeg, Vice-President C.N.A.B.

Mr. Geo. A. Crain, of Ottawa, the Retiring President.



Mr. Arthur Dinnis,
President Toronto Exchange.

Mr. Chas. Bulley,
Vice-President Toronto Exchange.

Mr. W. J. Nutkins,
Vice-President London Exchange.

trades in every city of importance in the Dominion will feel it in their interest to send delegates to our conventions.

There can be no doubt that our organization and annual gatherings can be made to serve a good purpose and have considerable influence in the forming of legislation bearing on our trade interests. Every session of parliament sees legislation, or attempts at it, in what is called "the interests of labor," but it is rare indeed that a member of parliament considers it worth his while to speak out in behalf of those but for whom "labor" would fare badly indeed. This should not be so, and I believe that if we were to assert ourselves, our legislators would listen to us more attentively.

At the present session of parliament, as at every session for years past, the question of fixing eight hours as a standard work-day has been brought up, and the matter is now before a select committee, upon the presentation of whose report the whole question will be finally disposed. In my opinion, this is a subject well worthy the serious attention of our organization, and we should see to it that our views are clearly placed before the committee in question. Such a law as is contemplated would bear most harshly on the building contractors, whose operations at best are confined to a few months of the year, many days of which are broken up by unfavorable weather. If, gentlemen, we can devise some means whereby we may be heard before the committee in question—and I understand it is the committee's desire to hear all sides—our meeting this year will not be barren of results.

Canada has undoubtedly recovered from the temporary check to industrial activity, and I believe that the coming season will see in this city, as well as in others, a distinct revival in every line. For years the building trades of London have been in the enjoyment of industrial peace, and I sincerely hope that it will be many years before that peace is broken.

Let me express my personal gratification at seeing here so many delegates whom I have met at previous conventions, and again extend to you all a hearty welcome, coupled with the hope that your visit to London will be one long to be remembered as pleasurable and profitable.

A suitable response was made to this address by Mr. Arthur Dinnis, president of the Toronto Exchange, following which Mr. J. H. Lauer, the secretary of the C.N.A.B., delivered an address dealing with the development and the work of the Association. He referred to the first meeting at Toronto, when only three building Exchanges were represented, namely, London, Hamilton and Montreal. Mr. Lauer paid a tribute to the excellent work of Mr. E. T. Nesbitt, who, in 1907, founded the Quebec Exchange, which now has a membership of over sixty. The speaker pointed out that the Association was composed of the six largest Exchanges in Canada: Quebec, Montreal, Ottawa, Toronto, London and Winnipeg. Mr. Lauer dealt with the responsible nature of the builders' calling and referred to the important industries which are allied with building "Eighteen million dollars expended in one year on bricks and mortar," said Mr. Lauer, "is a weighty tribute to the importance of the building industry in Canada." Following this address the minutes of the last annual convention at Ottawa were read by Mr. Lauer, and duly confirmed.

President Geo. A. Crain's address, which followed, was of considerable interest. The speaker dealt with the growing popularity and usefulness of the C.N.A.B. and to the continually expanding sphere of the Association. "If builders are to make any real progress in their various aims," said Mr. Crain, "they must make the architects respect them more." Mr. Crain held that the National Association would help considerably in this work. The speaker dealt briefly with the efforts of the Ottawa Exchange to obtain a uniform form of contract. He also referred to the undesirable practice of withholding percentages, quoting several examples from his own experience.

Vice-president E. T. Nesbitt, of Quebec, was of the opinion that the C.N.A.B. should be made quite as important an organization as the Manufacturers' Association, and that it should derive equally substantial benefits. Touching upon the eight-hour question, Mr. Nesbitt expressed the opinion that if the measure were adopted, the cost of construction would increase and higher prices generally would result. No good purpose would be served. The speaker deplored the unreason[illegible] continually demanding higher wages and less hours. Coming down to the troubles of the individual builder, Mr. Nesbitt touched upon the manner in which the average architect omitted to provide the contractors with proper details. It [illegible] an unlimited amount of time in this work. Mr. Nesbitt concluded by expressing the opinion that a special effort should be made to induce outside contractors' associations to join and co-operate with the federal body.

The next speaker was ex-Mayor Sam. Stevely, of London, Ont., who extended a hearty welcome to the convention. Mr. Stevely also referred to the insufficient co-operation of the archieects.

In the annual report of the secretary, Mr. J. H. Lauer, interesting and extended reference was made to the various aims and purposes of the Association. Mr. Lauer referred to what had been accomplished by united effort in New Zealand, and how the builders in that dominion had obtained a uniform form of contract by persistent joint action. Mr. Lauer contended that the Government is afraid of the labor unions, and that it is only encouraging the immigration of unskilled labor. Nothing is being done to induce skilled mechanics to come here. Mr. Lauer recently wrote to the High Commissioner in London, England, requesting that official to bring to the notice of skilled mechanics the opportunities afforded them in this country. In reply thereto he received a communication stating that it is the "avowed policy of the Canadian Government to encourage the immigration of farm laborers and domestic servants only." Speaking on the subject of technical education, Mr. Lauer stated that the Montreal Exchange had recently memorialized the Premier of Quebec asking for the incorporation of a trade school in the new technical school at Montreal, and had received a favorable reply. The financial report submitted by Mr. Lauer showed a balance of over $200 to the credit of the Association.

Before adjournment, the convention adopted a resolution expressing its appreciation of the courtesies extended by Mr. Weston Wrigley, secretary of the Retail Hardware Dealers' Association of Ontario. Towards the close of this session, Mr. J. A. Payne and Mr. J. W. Morley, two of the Winnipeg delegates, arrived and were accorded an enthusiastic reception. The afternoon session closed with the appointment of a committee on resolutions, this comprising Messrs. Dinnis (Toronto), Nesbitt (Quebec), Ferguson (London), Morley, (Quebec), and Ritchie (Ottawa).

Tuesday Evening, February 8th

The session opened with a few words of welcome from Mr. McMahen, secretary of the London Board of Trade. Response was made by Messrs. John Aldridge, of Toronto, and J. A. MacKenzie, secretary of the Ottawa Exchange.

The subject of technical education was the first matter discussed. Mr. W. E. Ramsay, of Montreal, representative of the Pedlar People, gave an interesting account of what had been done in recent years in the eastern metropolis. "The kind of education we want," said Mr. Ramsay, "is something similar to that given in the New England States, where, by a course of practical training, they fit men to become skilled mechanics." The various exchanges should urge the question of providing more practical work in the technical schools. The speaker was in favor of reviving the apprenticeship system—on a revised basis. He referred to the system in vogue thirty years ago, under which the master taught the boy and was responsible to his parents. The period of apprenticeship in the old days was seven years, but now the time could be shortened to two, three, or at the most, four years.

Speaking on the same subject, Mr. Nesbitt (Quebec), stated that the Quebec Exchange had petitioned the Quebec Government to establish trade schools in connection with the technical institute and had been promised consideration. Mr. Nesbitt gave a rather amusing instance of what the technical schools are doing. "Some time ago," said Mr. Nesbitt ,"I employed a boy at pulling boards out of a planer at 80 cents a day. He left me and I forgot all about him for the time. Seventeen months later he applied to me for a position. He had all the style of the young gentleman then. He had a chest of tools, called himself a full fledged joiner and demanded $2.25 a day." What the Quebec Exchange had done the speaker thought the other exchanges should do. Mr. Nesbitt was of the opinion that a boy would learn as much in a good trade school in three months as he did in the old apprenticeship system in as many years.

Mr. T. Cannon, Jr., complained that the work done in the technical school at Toronto was purely theoretical. There was no practical training. The speaker stated that his firm had found the apprenticeship system a failure. Apprentices are apt to get ideas above their job. He, Mr. Cannon, had to learn his trade from the ground up. He had both mixed mortar and carried the hod. The speaker was strongly in favor of the trade school as established at Chicago, where facilities are provided for doing the actual practical work.

Mr. George S. Gould,
Secretary of the London Builders' Exchange.

Mr. Geo. A. Crain (Ottawa), regarded a possible solution in the raising of the wages of the apprentice and in giving him proper encouragement.

Mr. Wm. Jeffery (London), contended that the apprentice should be advanced on merit. His own practice was to start a boy at three dollars a week the first year, and the second year to raise him to five and a half, and so on.

Mr. W. J. Morley (Quebec), maintained that both the apprenticeship system and trade schools were necessary. He thought that contractors should do their part and not leave it all to the trade school. He advocated a plan of placing a weekly sum to the credit of the boy for him to draw on the completion of his time. It furnished a good incentive and invariably worked out satisfactorily.

Mr. Gilday (Montreal), would educate the rising generation to a higher enthusiasm for mechanical training. The young man of to-day should appreciate the inde-

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in which are located the splendid new quarters of the London Builders' Exchange.

pendent position enjoyed by those [illegible] trade.

This brought the discussion to a close.

An account of the work of the Exchange at Winnipeg was given by Mr. W. J. Morley, of that city. Ninety per cent. of the contractors and 95 per cent. of the supply men at Winnipeg are members of the Exchange. Mr. Morley looks for labor troubles in Winnipeg during the coming season owing to the unreasonable demand for closed shop made by the unions. Mr. Morley considered that these bodies were getting beyond their legitimate sphere. They wished to place good and bad mechanics on the same level, fix wages and limit the number of hours a man should work. The builders should support the C.N.A.B. and have a [illegible] organizer. This would fortify the employers. The speaker deplored the fact that the influence of the labor people affected the ruling of the Legislature on very important points. At the conclusion of his address, Mr. Morley extended to the Association a cordial invitation to hold its next annual meeting in Winnipeg.

Mr. E. R. Dennis, of the Dennis Wire & Iron Company, London, then read the following paper entitled:

Reform in the Present Method of Awarding Contracts

Ralph Waldo Emmerson, in his Essay on Compensation, said: "Every act rewards itself," also that "Human labor through all its forms, from the sharpening of a stake to the construction of a city, or an epic, is one immense illustration of the perfect compensation of the universe." I would not presume to argue with the reasonings of the rare and gentle New England philosopher, but I would suggest that, [illegible] compensation, he missed the great exception, because he [illegible] never a contractor and never had to do with the estimating department of a contracting concern.

We all realize that under the present system of competitive contracts, contractors expend a very serious amount of time, energy and means on the preparation of estimates on proposed contracts, for which expenditure they receive no just compensation or reward. Let us endeavor to discover, with as much accuracy as the nature of the situation admits, the extent of this futile expenditure.

Proportionate Cost of Estimating

Some time ago, the Illinois Chapter of the American Institute of Architects appointed a committee to investigate and prepare a report on the present method of securing competitive bids. One of the results of this inquiry was to establish approximately the proportion, the percentage, which the cost of estimating bears to the value of the contracts. Five representative general contractors furnished statements, showing the time and money spent by them in one year in making competitive bids for buildings which would cost as a rule from $100,000 to $150,000. The average number of jobs figured upon by each contractor was 72. The average number which he obtained was 10. On each estimate, the average value of time spent by the office force of each firm was $125.00, I submit. But further, the average expense incurred on each estimate, in addition, by the numerous sub-contractors and supply men amounted to $378. Now, $125 plus $378 makes a total of $503 spent by each general contractor, his sub-contractors and material men on each bid. In addition to this, the head of each contracting firm spent 21 per cent. of the total time devoted to this business, in estimating, and overseeing the work of estimating.

Mr. P. L. Fraser,
Secretary of the Toronto Builders' Exchange one of the Delegates.

There are usually six or more tenders taken for each building. [illegible] for their calculations. $503 multiplied by six, gives $3,018 (or [illegible]) expended by these six firms bidding in preparing estimates. Each builder, [illegible] sub-contractors bids in common, by the general contractors, leaving [illegible]

[illegible]

[illegible] the expense of the bids from which work was actually [illegible] was [illegible], and the expense incurred for estimating other contracts, which they did not get, was $95,000. This [illegible] was a [illegible] loss to the five contractors, sub-contractors and material men in one year. This sum is charged on the books as estimating and office expenses. Someone has to make up the loss and if the contractors are to run their business profitably, the owners from whom buildings are obtained, must pay for it. The figures quoted as having been ascertained by this committee appear reasonable, and at all events they illustrate, graphically, the serious waste where a number of contractors perform the same work of taking off quantities.

Official returns from thirty cities in Canada record a grand total of building permits issued during the year 1909 of $68-606, 821. According to the figures submitted, the expense for estimating on the work amounted to about $1,360,000. Of this amount about $1,080,000 was spent fruitlessly. Another serious loss, from the standpoint of good construction, has been pointed out, and that is the time given by the heads of contracting firms in making and overseeing estimates.

Consideration of Suggested Remedies

Can a generally acceptable method be devised for compensating tenderers for their time, expense and trouble—a method that will be mutually satisfactory to the contractor, architect and owner alike? ''There's the rub.'' Our present system of competitive contracts does not seem to foster real co-operation and sympathetic service. It appears rather to have been devised upon the theory that a contractor should obtain his profit by skinning the cost of the work down to the minimum possible without violating the terms of his contract. Rather should the builder be assured of a just renumeration for the skill, care and energy he devotes to the direction of the execution of the work. The principles of equity and justice are frequently absent from many present day contracts.

Let us turn to a brief consideration of prospective remedies. An English contractor has suggested that when a building is to be erected, the owner will select his contractor, a man of repute in his business, just as he selects his architect, and that they together bargain for the work to be done. Where the work is of an exceptional character they invite a limited number to submit estimates—each competitor to receive a premium for the trouble and work imposed on him. This, perhaps, is an ideal condition which would without doubt further the real interest of the owner as well as the contractor, and the substitution of such a method for the present one would certainly mean a great benefit and gain to the character of every building constructed. But as my paper does not embrace the subject of ''The Dawn of the Millenium'' we will not spend any more of our limited time on our English confrere's proposal.

Frankly, I confess that I can neither see nor suggest any practical method whereby tenderers may be directly compensated for their expense and trouble, or whereby the demerits of our system of competitive bidding may be wholly eliminated, so long as human nature is at present constituted. We will always have with us the owner who wants to go shopping around everywhere he can, for fear he will perchance miss a bargain to be obtained, perhaps, at the expense of an inexperienced or incompetent tenderer. On the other hand we have the contractor who bases his prospect for profit on a chance of varying the specification, the meaning of which may be none too clear or definite. From inquiries I have made, I can find no instances, in the regular course of business, where contracting concerns are reimbursed for bids submitted where the contract is not awarded to them. Measures, however, may be taken to reduce to a minimum the cost of figuring.

The practice of competitive bidding is a very old one, and time was when the nature of the work was such that an experienced builder could estimate the cost with fair accuracy. The modern structure, however, has become so complicated that in some instances it is no easy matter to prepare safe estimates for the work. For these exceptional and complicated works it seems that a cost-plus-a-fixed-sum contract, is the fairest basis for carrying on the construction. For the general run of work, however, the lump sum contract seems to be the most satisfactory. In connection with this class of contract, the committee of the Illinois Chapter, to which I have already referred, submits an interesting proposal, the adoption of which would do away with nearly all the expense of preparing tenders.

The Professional Estimator and Quantity Surveyor

The plan in brief is to engage a professional estimator—paid by the owner. He would be absolutely independent in his position, like an auditor in financial matters. His success in business would depend on the reliability and accuracy of his estimates. Mr. Estimator would, I presume, have free access to the architect and would be able to secure a thorough understanding of all the details of the work to be done. He would submit his estimate or report on the cost of construction to the architect and owner. If the cost were satisfactory to the latter he could decide to proceed. The papers are turned over to a contractor in whom the architect and owner repose confidence. If he is satisfied with the estimate he would be awarded the contract for the estimated amount, plus a fee, depending on the character and magnitude of the structure. If, at the completion of the work, the building cost less than the estimate, it is suggested that the amount saved be divided equally between the contractor and the owner, and if the cost exceeded the estimate, then the loss would be divided equally. This arrangement, it is declared, would make the interests of the owner and the contractor harmonious, whereas now they are the opposite. While these suggestions are admitted to contain elements of merit, the plan does not receive general support.

Then there is the English practice of furnishing the bidder with quantities prepared by the ''Quantity Surveyor.'' From an economic standpoint I have already directed your attention to the palpable waste of a dozen contractors, more or less, performing the same identical work of taking off quantities. When the quantity surveyor is employed, the contractor's estimating is reduced to a matter of placing prices on the various items. The architect is responsible for the assumed quantities and dimensions and the cost to the contractor of figuring is reduced to a minimum. It is the subsequent duty of the surveyor to check over quantities, and it is ascertained to what amount the builder is entitled for extras.

One objection is suggested to the introduction of the quantity surveyor into Canada. Lump sum contracts are in vogue in this country, and our preesnt method of awarding contracts provides for placing upon the builder the entire responsibility for the cost of the building. When assumed quantities are furnished by the surveyor, to be subsequently checked, the gross cost is finally determined after the completion of the work. This, as has been pointed out, would be objectionable here to many owners, who would insist on knowing at the outset, just what the building was going to cost.

But why should all the responsibillty, risk and loss from miscalculation, for which he is not responsible, always be borne by the contractor? The architect is assured of definite renumeration for services rendered by his office—and he is certainly entitled to all he receives in Canada. Why should the owner object to paying the builder for just what he gets and no more?

I submit that the employing of a quantity surveyor would

(1) Reduce to a minimum the cost of estimating to the contractor;

(2) Ensure (prima facie) that the contractor receive fair renumeration for all material furnished by him;

(3) Secure a square deal to the owner (as well as to the builder) in that the former would get all he paid for and pay for just what he got.

Of course, there may be a fly in the ointment in connection with this system—but we are not yet living in Utopia, and it seems evident that the practice of having quantity surveyors furnish quantities to contractors would be, for the reason given, an improvement on our present system here. I am getting on in years and personally do not expect to see the day when contractors are directly compensated for tendering.

When an owner decides to pull down his barns and build greater, he is sure to become a staunch believer in the proverb, "Competition is the life of trade.' But it behooves contractors to secure conditions of competition that are fair and just. Whether material compensation for figuring contracts is possible of attainment or not, it is not easy to say, but many of us, I feel sure, are convinced that there is an ethical compensation, in the way of which there are no reasonable barriers.

Insufficient Information to Bidders

We would often consider it welcome compensation for the care and time we spend in figuring contracts, if the plans and specifications submitted to us for tender, gave us reasonably full and adequate information as to work required to be done.

Many of the plans and specifications from our architects convey a clear conception of just what is to be performed, but in too many instances such is not the case. In some work that comes out for tender, the bidders, in effect, simply and consecutively, make a series of bets as to what in their respective judgments will be required to be done. A contractor will often figure certain work from ⅛-inch or ¼-inch scale drawings and a weak specification. In the second act of the drama he is made happy by being awarded the contract, but in the third act, possibly a month or two afterwards, occurs the tragedy when he is generously presented with full-size details and dimensions of members, the like of which he had never dreamed and which produce the contractor's heart ache, that most of us, no doubt, have some time experienced.

You will agree that there are conditions prevailing in our present system of competitive contracting, which obtain in no other sphere of business activity. I have heard discussions and read articles wherein architects are unjustly blamed. We, ourselves, and not the architects, are the blameworthy ones, when we give definite and fast figures on work described on indefinite drawings and variable specifications. Safety in tendering lies either in the provision of proper details, or in the contracting concern submitting details showing definitely what they are figuring on.

What is often the cause of the wide difference in the bids of responsible and competent builders? And, why are contracts rendered unprofitable? Very often because of indefinite and weak specifications. When tendering, the contractor should be furnished adequate and comprehensive details and information. If this is difficult, the contractor should not be made to suffer in consequence.

With a plain, unmistakable specification, rigidly enforced, the business of the contractor will be less the vocation of the gambler. Prices will automatically become more consistent, and competitive tendering will become a more equitable practice.

In the discussion that ensued, Mr. J. H. Lauer expressed himself strongly in favor of having properly qualified quantity surveyors. Mr. Lauer instanced the success that had attended this practice in Great Britain. He thought that concerted action should be taken by the various Exchanges.

Mr. W. E. Ramsay quoted several forcible examples of the successful application of the quantity surveying practice in Montreal. He had always regarded it as an unqualified success.

Mr. Nesbitt was in favor of the system employed at Quebec, where bidders are supplied at a small charge with a bill of quantities. The speaker protested against the process of taking bids and then not awarding contracts. In this case there should certainly be compensation to the bidder. The various architectural bodies should be interested in this question.

Wednesday, February 9th

The morning session was opened with the reading of the following interesting paper by Mr. Chas. H. Gould:

This subject of organization is one which is occupying to a large extent the thoughts of the people to-day, and men are realizing as never before that only by united efforts can any branch of industry be a success. If the members of any such branch act independently of each other, they cannot fail to make life a struggle for the majority. Consequently, looking over the commercial and industrial conditions of to-day, we find that the members of almost every trade, business and profession have their organization.

I belive that the success or failure of any organization of men depends on two things, first, a true recognition of their position and the conditions by which they are surrounded, and second, their willingness to give the other fellow a square deal.

When the subject of this paper was named to me I noticed at once that it was divided into two clauses: (A) Employers helpless as individuals against the great labor combine, and (B) Shall the employer boss the job, or shall he be the mere tool of the labor "bosses?" I notice that it has been worded somewhat differently on the program, where it reads, "Shall the dog wag the tail or the tail wag the dog?"

I believe, gentlemen, that this is a wrong view to take of the conditions surrounding us. I fail utterly to find any fight to-day between labor and capital. There is, I know, a struggle on the part of labor for an existence which sometimes has the appearance of being against the interests of capital, but the real fight of to-day and that which is making life such a struggle for all men, is between capital and capital — contractor against contractor, supply dealer against supply dealer, manufacturer againts manufacturer. Because of that struggle, labor suffers, and not recognizing the true condition of affairs, thinks Capital opposed to it, and sometimes tries to hit back.

I do not think there is a man present—and indeed but few in this country—who do not prefer to pay their workmen a good wage if possible, and I feel sure that if we can overcome the unjust conditions existing among ourselves, the solution of the labor problem will be an easy proposition. I believe that it is just as easy for the tail to wag the dog as it is for united labor standing alone to affect our interests.

For any industry to be successful, all the branch organizations of that industry must work together. What was it gave the people of Montreal that for which many of them had been wishing and fighting for a long time? The early closing law. Was it because the employees formed a society of their own, and ignoring everyone else, fought for and obtained it? Or did the merchants gain the point in that way? No, they tried that for a long time and failed, and at last, banding together, they demanded and got what they wanted.

Did the retail grocers reach the position they occupy to-day by fighting their employees and the wholesaler and manufacturer? They could never have gained their present position in that way, no matter how strong they became as an organization. They realized that theirs was but part of a still greater organization, and, recognizing the rights of others, agreed to respect those rights. In return they received the help they needed [illegible], and today the whole grocery industry is firmly banded together and is a success.

What we who are engaged in the building business need, is to have every branch of our industry strongly organized—the [illegible] organization to be composed of separate sections such as the bricklayers, carpenters, painters, etc., and the contractors, supply dealers, manufacturers, etc., to be fully organized along similar lines. An arbitration board composed of all the organizations should be established, this body having the power to settle all questions affecting two or more of the separate organizations.

But after we have accomplished all this there will still remain the two most important points to be placed, namely, (1) placing ourselves on a foundation which cannot be undermined, and (2) gaining the good will of the public. For no matter what agreements we may make among ourselves, if that is all we have to depend on we will be in a position where unscrupulous men can successfully band against us. A good organization, if approved of by the public, will be more successful than one of which the people are suspicious, no matter how strongly it may be formed. How can we gain these points? I do not think we can find a better answer to this question than by studying the methods by which the people of Montreal accomplished that which they desired.

Instead of agreeing among themselves to close their places of business at an early hour, (an agreement which some of them would have broken the next day), and then telling the people that they would have to put up with it whether they liked it or not, they made a public claim that they were working under unnecessary and unjust conditions, and asked that laws be made which would correct those evils. And having the support of almost all those who were affected by those conditions and having demonstrated to the public that they were demanding only that which was just, they obtained the laws they desired.

What then is the practical need of organization as regards ourselves? It seems to me to be that we gather together, if not all, at least a strong majority of those engaged in the several branches of the building business, and with all the influence we can obtain, demand from our governing bodies such laws as will remove from us those conditions, which are unjust and unfair, and then if the representatives of the people sanction those demands the public will not be afraid they are being treated unfairly, and it will be possible for us to absolutely stop all recurrence of those methods and customs against which we find it so hard to contend to-day.

This may seem to some the vision of a dreamer, but our friends of the hardware organization are meeting here this week, several hundred strong. If they can do that, why cannot we do even greater things? We certainly do not know what we can do until we try, and I have a strong hope that it will not be long before we are as far in advance of them as they are at present ahead of us.

But we must not expect our governments to spend their time thinking about laws to amend the things which are injurious to us, while we are too selfish—or too indifferent—to give of our time and energy to do something for ourselves. In union is strength, always. We can, if we will, place our industry in a strong and satisfactory position; but to accomplish that, we must work together.

Mr. J. W. Morley (Winnipeg, Man.) took exception to the statement that there is no antagonism between labor and capital. He quoted several instances of arbitrary conduct on the part of the unions. These bodies were all right so long as they confined themselves to their legitimate sphere. At present they were trying to curtail the number of hours worked and the amount of work done. In addition to this, they, of course, wanted to regulate the wages paid. The speaker thought that it was quite time for employers to get busy in their own interests. The remedy was for the employers to build up a stronger organization than the unions possessed.

Ex-Ald. Ferguson (London, Ont.) asked: "Have we, in our organization, sufficient power to counteract the work of the unions?" After all, the strength of the workmen lay entirely in their organization. The workmen themselves were ignorant. They had good advocates for their cause, and they followed them blindly. Were there not some suggestions in this for the C.N.A.B.?

Mr. Arthur Dinnis (Toronto) did not see why contractors should bother themselves about high wages. If wages were lower, they would have to make their tenders lower accordingly. He thought that contractors should devote their energy to securing better profit on the work, without troubling themselves as to the relatively high cost of labor, compared with former times.

President Crain expressed himself as being entirely in accord with Mr. Gould: "We should strive to make the interests of labor and capital identical," said Mr. Crain, "and to secure the good will of the men. The only way to build up a business is to plan your organization and devise schemes for holding your staff together." The speaker was in favor of bonuses. It was a great incentive to a man to have an inducement of this kind before him and to be working for an employer who would keep faith with him. He, Mr. Crain, had taken work with practically no profit in it, solely with a view to keep his organization together. The whole solution of the problem was in treating the men properly and securing their co-operation.

Ex-Ald. Ferguson thought that this principle might work out satisfactorily in regard to small organizations, but such a scheme could not work out in the case of larger concerns who were obliged to frequently employ and discharge large numbers of workmen.

Mr. Crain said that this was a question of management. In the case of larger concerns the skeleton of their organization could be retained in the same way as was that of the militia in time of peace. It could be built up when required.

The main difficulty of the employer, from the point taken by Mr. William Pears (Toronto), was to be found in the fundamental principle of unionism—equalization of labor. Unionism had succeeded in establishing first, second and third rate workmen on one footing. The preponderance was with the third class workmen.

Mr. J. H. Lauer,
Sectrtary-Treasurer C.N.A.B., to whose zealous work the expansion of the Association is mainly due.

Mr. W. E. Ramsay quoted the success of his firm in granting presents to employees upon the completion of a particularly satisfactory, remunerative job.

Early in the afternoon, the delegates, responding to invitations from the Dennis Wire & Iron Company, Limited, the McClary Manufacturing Company, the Ideal Concrete Machinery Company, and Labatt's and Carling's breweries, paid a visit to these various industries where they were hospitably received and given an explanation of the various processes of manufacture.

The delegates found much interest in the Dennis Wire and Iron Works. A feature here was the construction of ornamental iron stair work, of which class of work the firm have a very considerable quantity in hand at the present time. Those who visited the pattern shop were interested in some rather unusual and difficult stair work patterns that were going through the hands of the wood workers. In the plating department were seen copper tanks with a capacity for handling the largest kind of architectural work. In the blacksmith department were being turned out, ornamental grills and railings. Upstairs were found wire working, light grill and locker departments. The construction and finish of the lockers seen in the various stages of construction were very favorably commented upon. The grill work, being manufactured for elevator fronts and other purposes, was also an interesting feature. In the round wire working department, wire window screens, the D. L. flexible door mat and other specialties in wire, were being turned out. The visiting delegates voted the Dennis works one of the most complete and up-to-date manufacturing establishments of its kind they had seen.

Some of the members visited the convention of the Retail Hardware Association and were much interested in the various exhibits made at that meeting.

Upon reassembly at headquarters, Mr. T. R. Wright (London) gave an address upon the "Rights of the Lowest Bidder." Mr. Wright said in part.

"Our trade has been honored, as has no other line of business, by the carpenter of Galilee, who taught us to do unto others, etc. I regret that this precept is often forgotten. We ought to be able to impress on the prospective builder that in placing his contract in the hands of a member of the Builders' Exchange, he can rest assured of having his building completed according to plans and specifications, without being subjected to trouble and litigation. As to the rights of the lowest bidder, I am of the opinion that if the man who puts in the lowest bid is a responsible contractor and has a reputation for supplying good materials and doing first-class work, he should be awarded the job. There are cases, however, when the contract should not be awarded to the lowest bidder. The reputation of the contractor should decide the point. For instance, suppose two contractors are figuring on the same job. The specifications call for the work to be completed in a certain length of time. One contractor always attends to business and rushes the work through so as to complete it in the time specified. The other has an unsatisfactory reputation for delaying work and causing annoyance to other trades. If two such men figured on the same job and the latter were the lowest bidder, I do not think that he should be awarded the contract. In conclusion, I would suggest that we impress upon the Government the need of a law compelling contractors to furnish bonds."

Mr. Arthur Dinnis and John Aldridge were opposed to throwing a man out after he had obtained the job. If he were incapable, he should not be allowed to tender in the first place. The rights of the lowest bidder were held by these gentlemen to be generally unassailable. Mr. Aldridge contended that it would be most injurious to trade if this were otherwise. An instance of close figuring was provided by Mr. Dinnis. He stated that he recently obtained a contract at $1,986. The next tender was $1,987.

Mr. W. E. Ramsay cited the practice of the Montreal architects. They have a preferred list of contractors engaged in the various trades, and never invite more than four tenders in any one department.

Mr. T. Cannon said that contracts should not necessarily be let to the lowest bidder. Inferior contractors should no more be allowed to set the price than inferior workmen should be permitted to establish a standard. The time would never come when the Association would have the power to settle the question. As to bonds for contractors, Mr. Cannon said that it was just as necessary to have proof that the client could pay for the building when completed as it was to have evidence to show that the contractor was able, financially and otherwise, to carry out the terms of his contract.

Following this discussion a number of resolutions were submitted to the convention by the committee which had been specially appointed for the purpose. These were read and adopted. The more important resolutions are the following:

To provide working expenses during the current year, 1910, including ways and means to extend the organization of the C. N. A. B., by providing transportation expenses of the secretary or other properly-constituted delegate to visit such centres as have not yet affiliated with the National Association. The assessment for the current year, 1910, per capita on all constituent exchanges be and is hereby fixed at 50 cents per member of each local exchange. Said assessment shall be due immediately upon adjournment of present annual convention, as per constitution, Article VII.

That in cases of strikes, or labor troubles, additional help to replace strikers shall be sought by the builders' exchange affected, through the co-operation of the other affiliated exchanges of the C. N. A. B., who shall pledge themselves to render all assistance possible without disorganizing their own local trade requirements.

That the Departments of Public Works in Ottawa, Toronto, Quebec, St. John, Halifax, Winnipeg, Regina, Edmonton and Victoria be respectfully requested to furnish plans and specifications of all projected public works to the respective builders' exchanges existing in the vicinity of the work contemplated, in order to facilitate convenient access to such plans by intending bidders, and to ensure wider and healthier competition in the public interest, such local builders' exchanges to guarantee safe keeping and return of plans to the Department at expiration of date named for tenders.

That each affiliated exchange shall request its respective provincial association of architects, that, when calling for tenders, every local architect shall supply full details with plans and specifications when the nature of the work demands it, so as to secure intelligent estimating on the part of the bidder.

That in view of the Workmen's Compensation Bills, now before the legislature of Ontario and Manitoba, an urgent request be made to the local exchanges of Toronto and Winnipeg to obtain copies of such proposed legislation, and to carefully watch and oppose any clauses detrimental to the interests of employees, by memorializing their local legislative members and also demanding permission to present their side of the case before the respective parliamentary committees in charge of such bills. Furthermore, that the executive of the C. N. A. B. pledges any assistance in its power to the local exchanges in question by sending representatives to strengthen their efforts if requested.

(Copy of resolution adopted unanimously at a meeting of the Builders' Exchange, London, Canada, January 25th, 1910. Re bill to limit work on government contracts to 8 hours per day.)

"(1) Whereas the adoption by the Federal Government of an 8-hour day on all public works would promptly result in a similar demand to be extended to all private building contracts; and

(2) Whereas such a law would undoubtedly lead to increased cost of building operations and consequent increase of rentals, constituting an added burden to the vast body of tenants (including artisans and mechanics) residing in our larger cities, to whom present high rents are already a serious item in the cost of living; and

(3) Whereas "an" arbitrary limitation of the working day is opposed to the climatic conditions of Canada, inasmuch as exterior building is already confined by nature to about seven months, into which limited period it is essential to get all outside work completed; and

(4) Whereas such a measure would constitute a "privileged class" opposed to the democratic principle of "equal rights for all," and would unfairly discriminate both against employers and contractors on non public works.

(5) Be it resolved, that while this association is ready at

all times to co-operate with the government in supporting legislation for the protection of life and limb in hazardous occupations whether by shortening the hours of work or by other protective measures, such protection is uncalled for in the building trades, and the proposed legislation would be against public policy and constitute an unwarrantable interference with the personal liberty of the individual, unjust alike to the worker, who would thereby be prevented from turning his spare capital (i.e., his labor) to account by utilizing it to make prudent provision for the winter months; and to the contractor who on most contracts is bound to complete by a certain time-limit, and who would thus be discouraged from competing on government works, owing to the great risk involved.

Resolved further, that a copy of this resolution be sent to the chairman of the select parliamentary committee, and that a delegation follow later, at the convenience of said committee.

That the builders' exchange of each province be requested to petition their respective provincial governments when establishing provincial technical schools, to incorporate a system of practical trade schools for the training and development of mechanical skill.

(Mr. John Aldridge took objection to the manner in which this resolution is framed. The government should be induced to establish a system of schools on the lines laid down in Detroit. When a boy left school he should have the opportunity of taking a four-months' course in order to discover his natural bent. The government must be shown the need of practical work in the trade school.

There was some division as to where the next annual convention should be held, Winnipeg and Toronto being the cities under consideration. Mr. Arthur Dinnis, Toronto, finally withdrew his invitation in favor of Mr. J. R. Morley, and the next convention will be held in Winnipeg.

The election of officers resulted as follows:

President, Mr. E. T. Nesbitt (president Quebec Exchange).

Vice-President, Mr. J. W. Morley (ex-president Winnipeg Exchange).

Provincial Vice-Presidents.

Ontario, A. Dinnis (president Toronto Exchange).

Manitoba, W. H. Carter (president Winnipeg Exchange).

Quebec, J. N. Arcand (president Montreal Exchange).

Executive Council (one representative from each corporate exchange): John Aldridge (Toronto), Geo. A. Crain (Ottawa), Thos. Gilday (Montreal), Wm. Tytler (London), Emil Cote (Quebec), and Chas. S. Shipman (Winnipeg).

Secretary-Treasurer, J. H. Lauer (secretary Montreal Builders' Exchange).

Mr. Nesbitt expressed his appreciation of the honor conferred upon him and stated that he would work for the extension of the Association into western Canada. "Don't divide the east from the west," said Mr. Nesbitt. "What we should have is a national organization with a permanent staff and a permanent secretary, like the Canadian Manufacturers' Association." A hearty vote of thanks was passed in favor of the retiring president, Mr. Geo. A. Crain, of Ottawa, who made a suitable reply.

At the conclusion of the business proceedings, the London Builders' Exchange was presented by the C.N.A.B. with a handsome arm chair, with an engraved plate attached thereto, as a souvenir of the convention. A resolution to grant $150 to the secretary-treasurer was carried with much enthusiasm. Mr. Lauer thanked the members and traced the line of the future work of the Association.

An Enjoyable Banquet

On Wednesday evening, February 9th, an enjoyable banquet was tendered to the delegates at the City Hotel by the London Builders' Exchange. About 150 were present. The toast list included the names of a number of excellent orators, and a good musical programme had been provided. The toast list was as follows: "Legislature of Ontario," Capt. T. E. Robson, ex-M.P.P.; "Municipality of the City of London," Aldermen J. H. Saunders and Stevenson; "Manufacturers' Interests," Messrs E. R. Dennis and Wm. Gerry; "Mercantile Interests," Messrs. S. Stevely and Donald Ferguson; "The C.N.A.B.," Messrs. Geo. A. Crain and J. H. Lauer; "The Sister Exchanges," Messrs. E. T. Nesbitt, A. S. Dinnis, W. E. Ramsay, Thos. Gilday and F. Armstrong; "Retail Hardware Association," Mr. Brocklebank; "The Architects," Messrs. H. C. McBride, W. G. Murray and A. E. Nutter.

Mr. E. R. Dennis, who replied to the toast of "Manufacturers' Interests," spoke of the importance of promoting and developing manufacturing interests. The speaker considered that technical education had an important bearing upon this. He referred to the excellent system of technical and trade schools now in vogue in Germany.

Mr. Geo. A. Crain, who replied for the C.N.A.B., spoke enthusiastically upon the business of a contractor. "If I had to start life over again," said Mr. Crain, "there is no calling I would chose other than the one in which I am now engaged." The speaker urged those present to strive to establish a higher standard of ethics in the business. Membership in the C.N.A.B. should stand for honest work—fulfilment of the contract to the letter. Mr. Crain concluded by thanking the various city bodies and the London Builders' Exchange for the hospitality shown the visitors.

Replying to the toast of "The Sister Exchanges," the new president, Mr. E. T. Nesbitt, gave an interesting account of what was being done at Quebec, where there were 71 Frenchmen and only three English-speaking members in the field. Mr. Nesbitt said that he attached special significance to his election as president. To him it was an indication that the C.N.A.B. was anxious to extend its good work into every section of the country.

Annual Banquet Quebec Builders' Exchange

The Quebec Builders' Exchange held its first annual banquet on February 5th. As a live and enterprising organization the Exchange ranks second to no other body in existence in Quebec. The members are enthusiastic in the work of the Exchange, taking the spirit from Mr. E. T. Nesbitt, their president, who organized the society in 1907. About 70 members and guests sat down to dinner, which was presided over by President Nesbitt. Others present included Messrs. D. Ouellet; Ald. Lemay, Emile Cote, vice-president of the Exchange; G. A. Vandry, president of the Quebec Board of Trade; Jos. Picard, president of the Quebec branch of the Canadian Manufacturers' Association, and P. A. Lamonde, first president of the Exchange.

President Nesbitt dwelt at some length upon the work and aims of the Exchange and referred to the need felt by the city for a system of building inspection. The speaker quoted from the "Contract Record" of Jan. 12. In this issue, building statistics were furnished by the principal cities and towns throughout the Dominion, but Quebec was notable only by its absence. Mr. Nesbitt appealed to candidates for civic honors in the municipal elections to pledge themselves to work for the organization of an inspection department.

Estimating by a Reliable Uniform System

The Fifth and Concluding Number of a Series of Practical Articles Designed to Illustrate the Advantages of Up-to-date Figuring

Specially Contributed by W. M. Brown, Collingwood, Ont.

Glazier Work—Frequently the glazier work is executed by the painter, and is, therefore, included in this item. Glazier work is usually considered of minor importance in building operations, but for the comfort and attractiveness of the home much depends upon its proper execution.

There are different kinds, qualities and shapes of glass adopted for the respective requirements. In the measurement of all glass, the extreme size to be taken and calculated into superficial feet. All fractions of inches to be charged as full inches. The kind and quality of glass to be minutely described. In measuring windows that have astragals, the panes of glass are measured to centre of astragals, and allowance made for insertion in side, top and bottom frames or rails. Sometimes the window sash includes glass, glazing and priming one coat oil paint. In large rooflights, the panes are measured separately and classed as to kind, and calculated into superficial feet and priced. Lattice work and glass to be measured together, not by the pane, but in compartments or lights, each compartment or light being measured at its extreme size. Glass in tracery heads or the like, to be classed separately, and the price to include for all moulds required. The prices for all lead lattice work to include iron stiffening rods and copper wire fixing, also pointing and painting. The diameter of rods and their distance from each other to be specially described.

The glass in windows having small panes, each containing under two superficial feet of sheet or crown glass, and separated only by astragals, to be measured within the frames, and over the astragals; any fractional parts at astragals not to be allowed, but the fractions at frames to be dealt with as previously described.

The cost of cutting glass to angle or circle to be included in the price per foot, but such glass to be classed separately, and the price to include for any moulds required. The price of glass in all cases to include for priming, puttying with pins, catches, and work glazing. Where painting is included with glazing the measurement shall be same as the glazing.

Painter Work—There are two departments of painter work, viz., outside and interior work. There are several features in connection with outside painter work that have to be considered in forming a correct estimate. There is the facility in which the work may be executed. Where much ladder work is required there is often the time lost in shifting and removing ladders to convenient positions. Again, there is usually a greater degree of caution exercised in this class of work, as the situations are more hazardous. This waste of time must be taken into account in framing and calculating the estimate. Again, the intricacy of the work should also be considered, such as painting ornamental [illegible] and finials, or ornamental railings and gates. This depends, of course, upon the design; and careful attention should be given to this feature of the work. Wood linings, doors, etc., to be measured and calculated per superficial yard. Ornamental railings, gates and crestings to be minutely described and classed separately, measured and calculated per superficial yard.

In measuring the painter work of [illegible] it is preferable to see the work to be executed, as in many cases the expenditure of time on the astragals cannot be correctly calculated or measured by superficial measurement, and priced at a common rate. Frequently the cost of painter work of conservatories is ascertained by a note of the materials employed and time taken to execute the work. This method is generally the most satisfactory. Wherever mouldings or beads are painted a different color or shade they should be measured by lineal foot and charged for extra value. In measuring the interior painters' work of house, take each apartment separately. Note down what has to be done to ceiling. Measure same, the length by breadth, and calculate same into superficial yards, pricing at current rate. Walls to be measured next in a similar manner, calculated into superficial yards and priced. Cornices to be measured and priced per lineal ofot, the number of shades and girth to be stated. Centrepieces to be enumerated and priced, stating number of shades and diameter. Windows, doors and other woodwork to be measured and calculated into superficial yards and priced. When painting is done in shades, to be charged extra over common paint. Skirtings, bases and surbases to be measured per lineal foot, stating girth. Mantelpieces to be described and priced according to class. In estimating painter work the time of men travelling to and from the job to be considered and allowed for. Scaffolding also is an important item to be allowed for, especially for roofs of churches and public buildings. The architectural design will regulate the amount of scaffolding required, and the time employed in erecting the same.

West Elevation (House at Collingwood, Ont.—See Articles 1-4 of this series)

At the close of the C. N. A. E. convention at [illegible] last week, two of the Winnipeg delegates, Messrs. J. R. Morley and J. W. Payne, left for Detroit, Mich., to attend the annual convention of the International [illegible] Association.

Improving a Small Municipal Lighting Plant

Economy of Skilled Engineering Service for Such Work Costs and Methods on an Interesting Case in Point

Recent observation of the operating conditions in a number of small power plants suggests that the practice of such stations must be brought into harmony with methods found successful in large installations, if present sources of waste and inefficiency are to be removed. While it may be necessary to avoid the refinements which frequently produce record figures in large stations, enough of their methods remains to enable substantial savings to be gained under skilled engineering treatment. A recent investigation of the municipal lighting plant at Marblehead, Mass., by Mr. C. W. Whiting, of Boston, indicates certain lines of attack which not a few stations of small capacity might follow advantageously to secure greater service reliability and lower generating and distributing expenses. It is well to bear in mind that however satisfactory a plant may be as a mere source of current, close attention must be paid to the technical features of its administration and development if anything like acceptable service is to be expected

The Marblehead station was found to have boilers of excellent type for the service required, the installation being a horizontal return tubular one with enough capacity to permit the retention of one boiler as a spare unit. Sources of inefficiency in the operation of the boiler plant were the presence of scale in considerable quantities; failure to check the weight of coal purchased or burned; absence of analyses of the feed water, and lack of means of measuring the quantity of water used by the boilers. With one boiler lying idle, the normal capacity available was equivalent to 444 k.w. at the switchboard with the present arrangement of the station. The maximum load on the station last year was 340 k.w. It was shown that an open feed-water heater would assist in the removal of scale-forming material, and that the use of a separate meter for boiler feeding would enable the performance of the boilers to be scrutinized effectively. In place of a fireman's estimate of the coal consumption during 24 hours, in 8 of which he is on duty, regular weighing was shown to be imperatively necessary for definitely successful operation

The engines in the station were found to be well designed, well constructed and in good condition, with a combined normal capacity of 363 h.p. Both were connected to a line shaft by belting, and one was operated non-condensing, developing 138 h.p. at the fly-wheel. The second unit was a cross-compound condensing outfit rated at 225 h.p. at the fly-wheel. The belts and shafting absorbed about 30 h.p., and at the peak of the yearly load the engines were run at 51.5 per cent. overload. There was no reserve, and if either unit had been shut down during the peak, the town would have been in comparative darkness. The generators consisted of eight dynamos of assorted types and sizes, only one machine being of the standard 2,300-volt, three-phase, 60-cycle design now common in central station work. The direct current arc machines used in the plant were found to be worth little more than their scrap value, being obsolete in type, inefficient and badly depreciated, with hand regulation. Such equipment jeopardized the service by its retention. Although there was sufficient dynamo capacity in the plant to handle the peak load, the different machines could not be handled with any degree of flexibility on account of their character and the shaft drive. The switchboard was also found to be in need of remodelling, there being seven panels of five different types in its composition. To secure better results it was pointed out that the three watt-hour meters installed should be placed where easier reading could be effected; that a watt-hour meter on the street lighting circuit would be useful, and improved wiring on the rear of the board advantageous.

The street lighting was found to be very unsatisfactory, with unsteady and poorly distributed units. It was found that by the use of so-called direct current metallic arcs, with mercury arc rectifiers, a total saving of $1,649 per year could be made in the operation of the street illumination system, giving much better lighting than at present. Tungsten incandescent lamps were advised for supplementary service on the streets. Improvement in the methods of keeping the station records and in the complete tabulation of data called for on the blanks was also emphasized as necessary to the best service. The plant kept no record of the amount of cylinder and lubricating oil used, or the temperature of its feed water. The total estimated cost of current at the switchboard, including interest and depreciation on the cost of the equipment, but not on the cost of the land and building, was 3.67 cents per k.w. hour for last year. By making changes in the equipment and adding two small steam turbines, at a total cost of about $28,000, it is estimated that the current can be furnished at 3.10 cents, a saving of 15½ per cent.—"Engineering Record."

High Carbon Steel for Concrete Reinforcement

This was the subject of discussion at the Engineers' Club of Toronto on Thursday evening, Feb. 3rd. The topic was opened by Mr. Peter Gillespie, who referred at the outset to the experiments of Considere and others, showing that the extensibility of concrete in the immediate vicinity of steel reinforcement is very much greater than is that of concrete not reinforced.

The published results of experiments by several investigators were cited to prove that there is little evidence that visible cracks occur in concrete reinforced by steel the stress in which is not greater than 15,000 pounds per square inch. On the contrary, the elongation of plain concrete under stress is probably not greater than one-hundredth of one per cent. before rupture, a deformation which, having regard to the relative rigidities of the two materials, would accompany a steel stress not exceeding 300 pounds per square inch.

There is in concrete of the better grade a so-called "elastic limit" more or less clearly marked. This will occur at approximately 60 per cent. of the ultimate crushing strength A working stress of half this, or 30 per cent. of the ultimate, would be permissible. For all intents and purposes, the elastic limit of the steel controls the ultimate strength of a steel-concrete structure, at all events for structures adequately or insufficiently reinforced.

In order to utilize, in case of necessity, a portion of the strength of concrete in excess of its "elastic limit," the elastic limit of the steel, should be developed after the elastic limit of the concrete has been passed. To have the ultimate strength of the latter coincide with the elastic limit of the steel would necessitate a factor of safety for steel much larger than is really necessary.

It was then shown that a working stress in steel of one-third its elastic limit to accompany a working stress of 30 per cent. of the ultimate strength of the concrete, will secure this desideratum. If this, again, be limited to 15,000 pounds per square inch, as above, it will call for an elastic limit for steel of 45,000 pounds per square in., a value, while higher than that of medium steel, is not likely to be accompanied by the treacherous qualities likely to display themselves in steel whose elastic limit and ultimate strength are excessively high.

Mr. C. R. Young, in discussing Mr. Gillespie's address, was of the opinion that the advantage of using high-carbon steel was practically limited to the increased factor of safety thereby introduced into the design. It was quite true, as Mr. Gillespie had pointed out, that a considerable widening of the range of loading upon the structure was made possible by employing for reinforcement a steel with an elastic limit of from 40,000 to 50,000 pounds per square inch, but the utilization of this reserve strength at all frequently, would be highly undesirable. Experiment had shown that cracks in the concrete adjacent to steel in tension could be detected by careful observation when the stress in the steel was only 5,000 pounds per square inch. An increase in the stress was accompanied by an enlargement and an increase in the number of the cracks, so that the best authorities were inclined to limit the working stress in steel reinforcement to 15,000 pounds per square inch and under. In Europe, working stresses still lower than this were commonly adopted, 12,500 pounds per square inch being specified in a number of building codes for continental cities Since the moduli of elasticity of high-carbon steel and medium steel were practically the same, no greater stress could be used for the former than for the latter, and where overloading was highly improbable there was no advantage in employing a material of high-carbon content, by reason of its cost being greater than for medium steel and its properties subject to greater irregularity. The latter material being easily obtained and readily bent to the desired shape in the work, was in most cases more satisfactory than any other yet proposed.

Mr. L. J. Street suggested that the irregularity and brittleness of high-carbon steel might arise from the cooling of the bars by water before the last pass through the rolls.

Messrs. R. A. Baldwin, J. A. Culverwell and T. T. Black were of the opinion that serious effects might arise in reinforced concrete work if water were permitted to come in contact with the reinforcement.

Mr. T. R. Loudon pointed out the necessity for careful inspection for both high-carbon and medium steel reinforcement material.

Mr. C. M. Canniff, the president of the club, was in the chair.

At the regular meeting of the Engineers' Club of Toronto, held in the new Mechanical Laboratory Building of the University of Toronto last week, a lecture on "Turbine Pumps" was given by Prof. Robert W. Angus, who explained by the use of lantern slides the construction and operation of this type of pump and gave many details of the construction of the latest designs.

Good Roads Convention for Ontario

Nineteen counties in the Province of Ontario have adopted the Good Roads system and planned the improvement of 3,000 miles of their leading highways. The Good Roads Association of Ontario consider the time favorable for a general advance in the construction of good roads throughout the whole province. With this in view, they are arranging for a widely representative convention to be held in Toronto on March 2nd, 3rd and 4th. The programme will provide for a valuable series of addresses from superintendents of country road systems already in operation, explaining the method of construction, machinery and material used, cost, and other details. Experts, in addition, are being secured from New York, Pennsylvania, Massachusetts and other States where the finest roads in America have been built up. After a thorough discussion, it is proposed to decide upon some policy that will include the most valuable points of all these systems. During the convention a deputation will wait upon the Provincial Government to consult with it as to future assistance. As over 500 delegates are expected to attend, single fare rates will probably be secured. Communications should be sent to the Secretary of the Ontario Good Roads Association at Whitby.

It is rumored that Mr. G. H. Bryson will be appointed city engineer of Victoria, B.C., to fill the vacancy caused by the resignation of Mr. C. H. Topp. The latter will continue for a time in a consulting capacity, afterwards joining the civil engineering firm of Gore & McGregor.

During the recent convention of the Canadian Society of Civil Engineers at Ottawa a rumor was heard that the American Society might hold their annual meeting in the Federal capital.

City Engineer Bell has been invited to address the Good Roads convention in Toronto upon the subject of "Concrete Bridges."

Cost of Bricklaying by a Municipality

As a result of the very careful investigation of the Sewer Department of the City of Boston, Metcalf & Eddy, consulting civil engineers to the Boston Finance Commission, present in a recent report some very interesting facts regarding the cost of brick laying by municipal employees. Comparing the smaller sewers built by the Massachusetts Metropolitan Commission with those built by the day labor force of the City of Boston, the engineers find the prices ranging from $9.04 to $18.34 per thousand on the day labor work, whereas on the Metropolitan work done by contract the highest price was $4.23 and the lowest $2.77.

Based on the number of brick laid, the difference between the day labor work of the city and the contract work of the Metropolitan Board is as noticeable as is the difference in cost. These items are particularly interesting when it is noted that upon the city work, taking the average for a whole week, the number of brick per mason per hour was as low as 13, and the largest number was 242, as against 94 and 570 respectively upon the Metropolitan work. The highest number per hour for the average of an entire job done by the Sewer Division was 78, whereas the lowest average upon Metropolitan work was 165 and the highest [illegible]

The engineers [illegible] that [illegible] the excessive cost under city administration was due to the fact that sufficient work was not always presented to keep the masons busy, but taking material and labor costs into consideration it appears that the total cost for brick masonry in the sewers was $30.75 per thousand brick and $18.45 per cubic yard of brick work on the basis of 600 brick to the yard. It is shown that a fair price to pay for Portland cement concrete [illegible] would not be in excess of $8.00 per cubic yard. The engineers therefore recommend the substitution of concrete [illegible] in sewer construction wherever possible.

The New Toronto Plant (now in course of erection) of the Standard Sanitary Mfg. Company.

Important Branch Factory at Toronto

One of the most enterprising supply firms in the Canadian field to-day, and a concern which claims to be the largest manufacturer of plumbing fixtures in the world, is the Standard Sanitary Manufacturing Company of Pittsburg, Pa The accompanying illustration is a view of the new Toronto factory of this concern as it will appear upon completion. The building will be constructed of reinforced concrete and will embody the latest features of design and construction in accordance with the progressive policy of the firm. Three or four hundred men will ultimately be engaged in this plant in the manufacture of "Standard" sanitary ware. The company is to be congratulated upon the establishment of this plant, which will facilitate matters greatly in distributing the products of the firm throughout the country. Moreover, it will increase the service rendered through the job houses which have already been established in Toronto The Canadian office of the company is at 39 St. Sacrament street, Montreal. The Toronto show rooms are at 55-61 Richmond street east.

Discussion on the Quebec Bridge Disaster

The discussion of the Quebec bridge disaster is one that loses no interest, and there is practically no limit to the information that can be gleaned from its mass of wreckage.

Mr. Henry Holgate, C.E., who gained an intimate knowledge of details of the failure, from his work on the investigation commission, made the Quebec bridge the subject of a satisfactory lecture in Montreal on the 10th inst. Mr. Holgate had a number of excellent slides, showing chiefly the south anchor arm and the cantilever arm. In the course of his discussion, he laid stress upon the fact that the raw material used in the construction of the bridge had been without a flaw. In spite of the great contortion and twisting that the steel had undergone, the closest inspection had failed to reveal a single crack. The friction, due to the falling, had been terrific, and as a result the metal in places had melted and fused.

The collapse had been due to the failure of one rivet, but even if this had held, it is questionable whether the bridge would not have failed at another point. The designers had estimated the dead load upon the members at 55,000,000 pounds, whereas in reality the actual dead load upon the bridge was 75,000,000 pounds. Older bridges, Mr. Holgate pointed out, were able to carry larger loads than designed for, because, through gradual usage, the different members were working in unison to best advantage. This, of course, could not be possible in the new bridge.

An interesting fact pointed out by Mr. Holgate was the design of the different members. Tension chords were made smaller than they were when actually in place, while compression chords were made larger. The setting of the members were consequently loose jointed the compression members being oftentimes fifteen degrees out of plumb. Mr. Holgate also drew attention to the fact that in planning the Quebec bridge, the designers had used a higher unit stress than had previously been customary for this class of construction.

Montreal Branch Can. Soc. C. E.

A meeting of the general section of the Montreal branch of the Canadian Society of Civil Engineers was held on Thursday, the 10th inst., in the Dorchester street rooms. The paper dealing with "The Avonmouth New Harbor, Wet Rock and Graving Dock," read a short time ago by Mr. A. D. Swan, was discussed. The question of the relative cost of construction work in Canada and Great Britain was brought up, and at a later date Mr. Swan will give some interesting figures covering this subject. A short paper on reinforcedr concrete pile work, by Mr. E. Mohun, M.C.S.C.E., was also read. The meeting of the electrical section, called for the 24th inst., will not take place until a later date, when a paper will be read by Mr. J. E. Dalemont, on "Resistance in Transmission and Distributing Circuits."

Permits issued at Cornwall, Ont., during 1909 represented a value of $30,000, compared with $15,000 for 1908. Mr. McTavish, town clerk, informs us that the prospects for 1910 depend largely upon what takes place at Ottawa in connection with the proposed dam at the Longue Sault Rapids.

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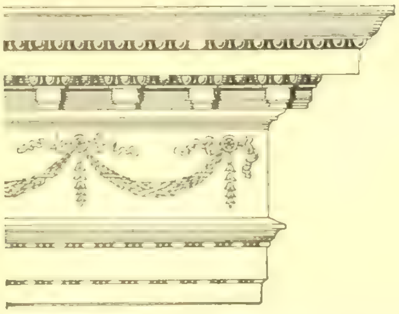

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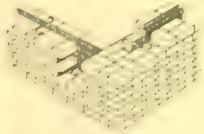

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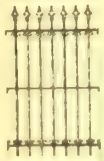
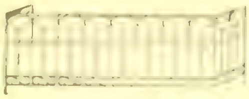
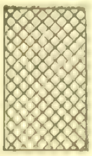


Steel Picket Door

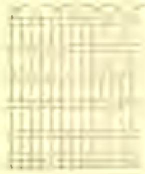


Steel Balcony Railings

Wire Window Guards



Steel Window Guard



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Personal News and Notes

The Winnipeg Builders' Exchange will hold its annual banquet on Feb. 21st, in the Manitoba Hall.

Mr. F. Harry Mace has opened an office as consulting engineer at 630 Confederation Life Building, Toronto.

At London, Ont., last month, building permits were issued to the value of $61,810. The total for January, 1909, was $21,885.

At the annual dinner of the Plumbers' Company held in London, England, recently, the Lord Mayor of York, as a practical plumber, urged the advisability of retaining the old apprenticeship system.

Mr. A. R. Macdonell, the contractor who built the Temiskaming & Northern Ontario Railway, will ask the Government for a fiat in order to enable him to sell for the payment of extras in connection with the construction of the road.

Mr. Stephen Newton, fomerly erecting engineer for the Dominion Bridge Company, of Lachine, has accepted the position of general superintendent of construction for the Structural Steel Company, Limited, of Longue Point, Quebec.

A dispatch from Windsor, Ont., states that Mr. Basil D. D. Rorison, aged 26 years, a civil engineer employed by the Detroit River Tunnel Company, was instantly killed by falling 60 feet down shaft No. 1 at the Canadian approach to the M.C.R. tunnel.

The International Waterways Commission has finished the report of the proposed million dollar dam to be built between Lake Erie and Niagara river to raise the level of Lake Erie. It will be submitted to the Governments at Washington and Ottawa. The report has taken six years to prepare.

At the fortnightly luncheon of the Manitoba Association of Architects held recently, the advisability of an amalgamation of the provincial architects' associations throughout the Dominion with the Royal Architectural Institute of Canada was discussed at some length. The holding of educational classes was also brought up for consideration and arrangements were made for a regular series.

Samuel Cabot (Inc.), Boston, Mass., are publishing a concise and interesting little booklet dealing with their waterproof brick stain and preservative for coloring and waterproofing brickwork. From the number of testimonials sent in to the firm by satisfied users, it would appear that the company's products are going ahead on their merit. Other lines manufactured by the firm are creosote shingle stains, sheathing and deafening "quilt," waterproof cement stains and "Conservo" wood preservative.

It was rumored recently that Mr. J. S. Irvin would retire from the board of the Canada Cement Company on account of his interest in a new cement plant at Spokane, Wash. The construction of the Spokane plant will begin early in the spring and Mr. Irvin will be president of the company. Mr. Irvin emphatically denie the report of his retirement and expresses his confidence in the future of the Canadian concern. It is announced that the Canada Cement Company has received the contract for supplying all the cement required in the construction of the Quebec bridge. It is possible that the contract will call for 150,000 barrels or more

The first meeting of the Engineers' Society of the University of Manitoba, held at Winnipeg last week, was addressed by Mr. T. Aird Murray, C.E., on the subject of sewerage disposal. H. N. Ruttan, city engineer, presided. Mr. Murray took up the history of the sewerage disposal and spoke of the results obtained in England, Germany, Austria and France and the recent installations in America, deducing from these what is to-day considered the most efficient method of disposal. Mr. Murray presented lantern slides illustrating these principles. The student attendance, as well as that of the outside members of the profession, evidenced the popularity of the course. The society will be addressed later by City Engineer Ruttan and J. E. Schwitzer, chief engineer of the C.P.R. western lines.

The fifth annual convention of the Ontario Retail Hardware and Stove Dealers' Association was held at London, Ont., on February 8-11. It was attended by representatives from every corner of the province and distant parts of Canada. In all, about 250 attended the convention. Hardwaremen were present from New Brunswick, Manitoba, Saskatchewan and Alberta. An interesting feature of the meeting was the exhibition. Prominent among the exhibitors were the following firms: Ideal Concrete Machinery Company; Scott Machine Company; Dennis Wire & Iron Company, Limited; Hobbs Manufacturing Company; Goldie & McCullough; International Varnish Company; Lufkin Rule Company; F. W. Bird & Son; Brantford Roofing Company, and Gurney-Tilden Company. The front of the City Hall was converted into a modern store front. At night, the building was illuminated by an electric "Welcome to London." The officers of the association are to be congratulated upon the successful manner in which the various arrangements were carried out.

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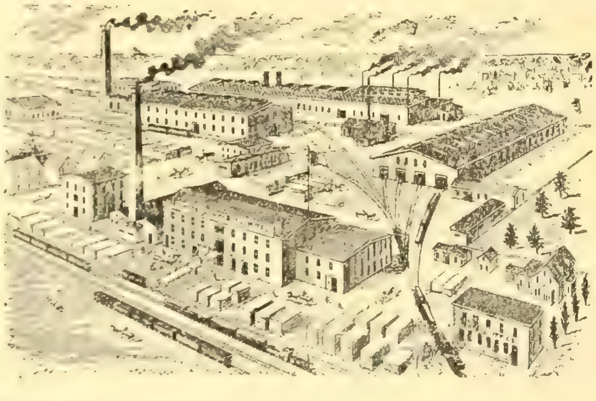

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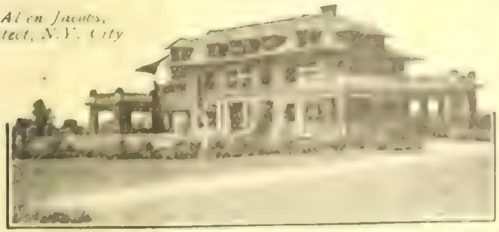

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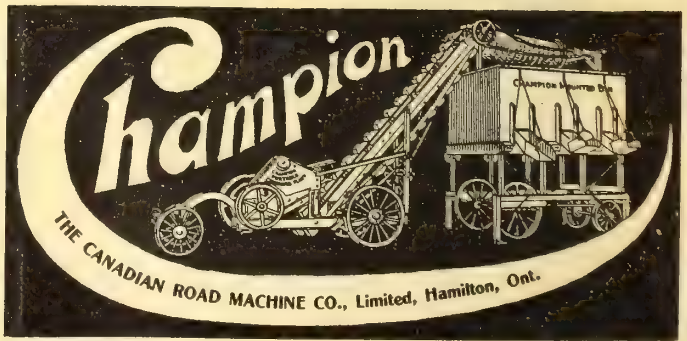
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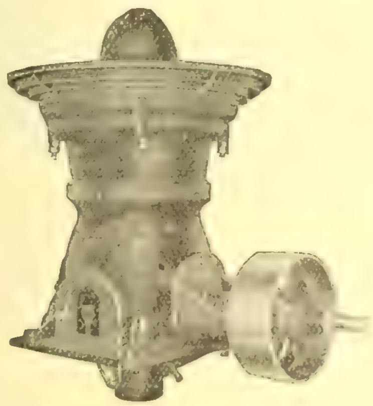

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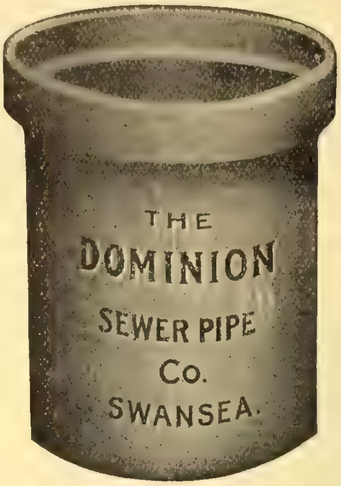

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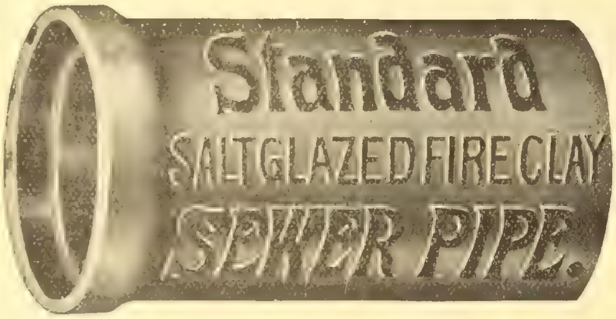

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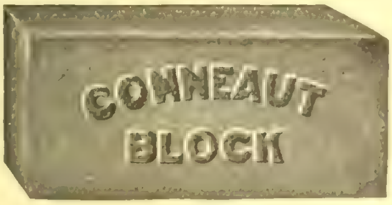

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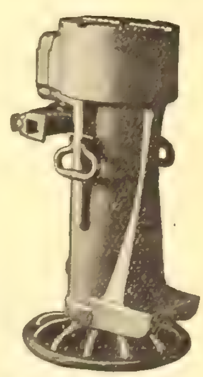

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26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
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The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

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40 u. i.	4.25	3.75	7.25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

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¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
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3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
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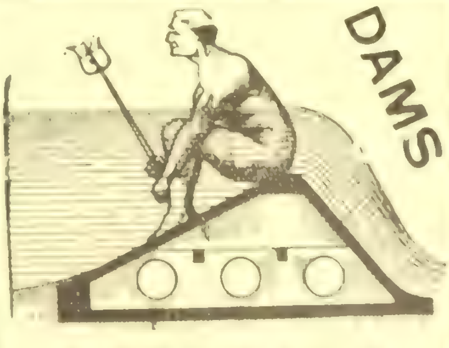

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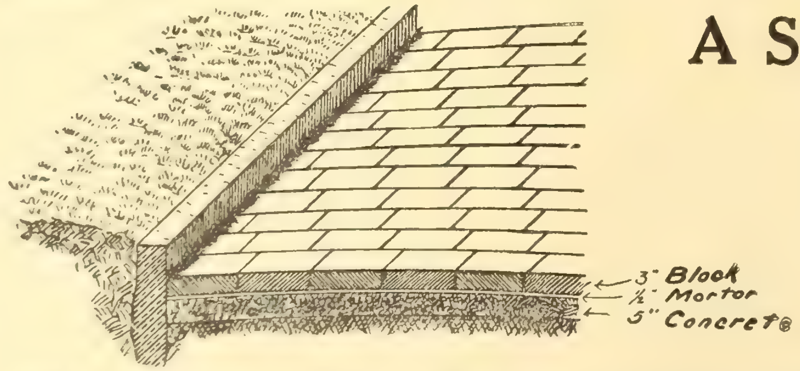

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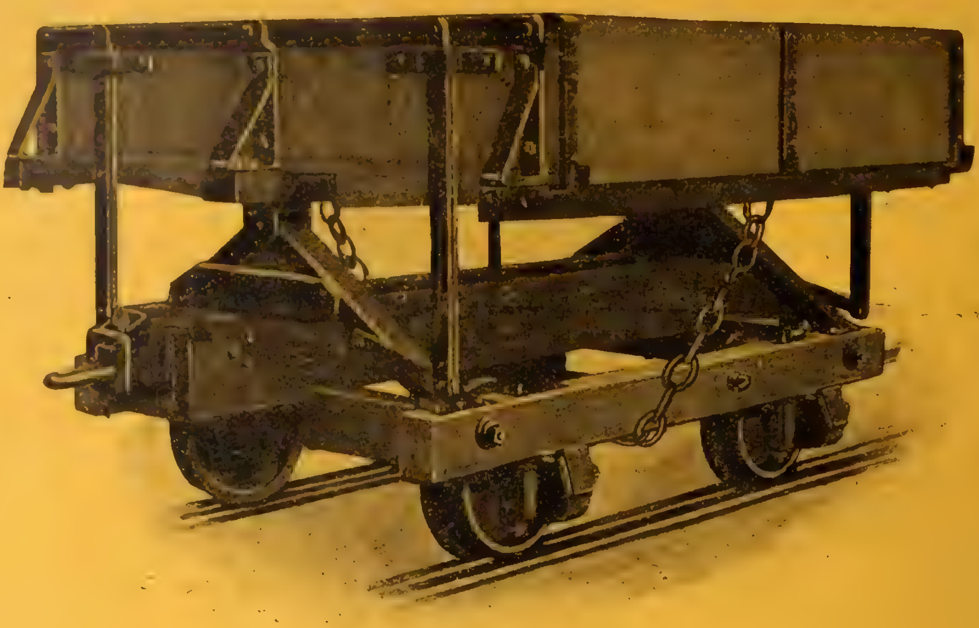

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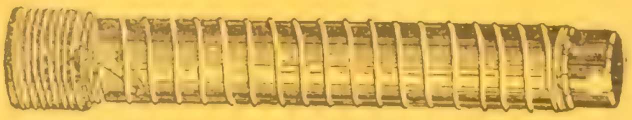

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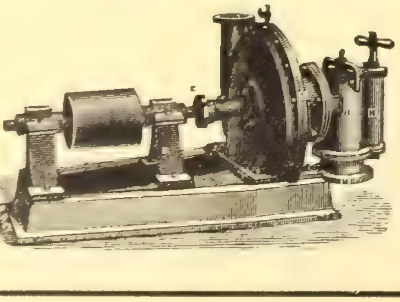

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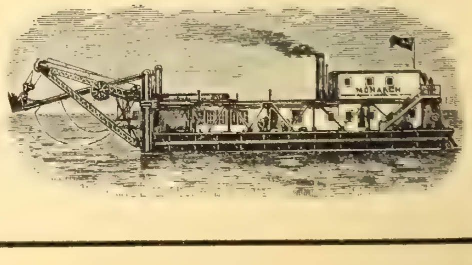

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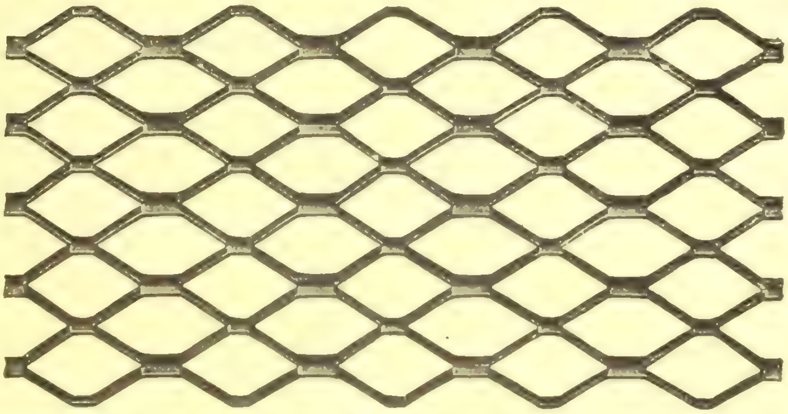

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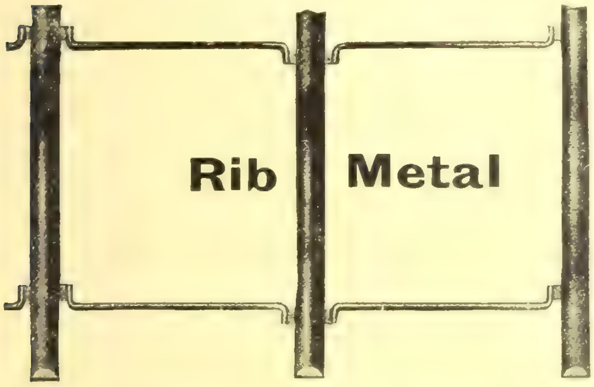

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We make everything in Church Furniture.

Blonde Lumber & Mfg. Co.
Limited
Chatham, Ontario

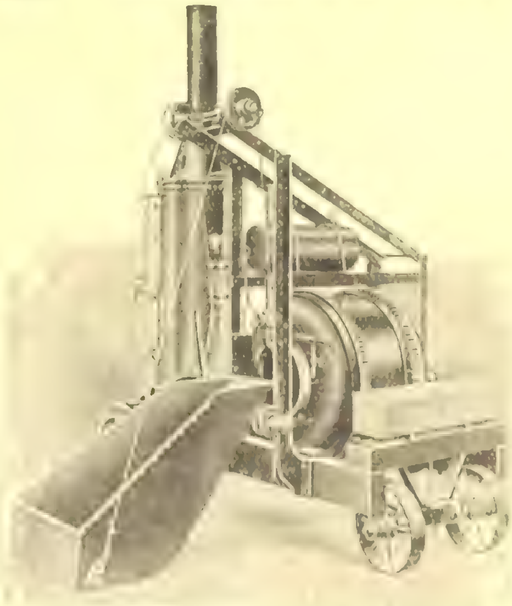
Koehring Concrete Mixers

Steam, Motor or Gasoline Drive

Simple in Operation

Made in sizes to meet all requirements.

Substantial in Construction



Koehring Mixers have proved their superiority by quick action — uniformity of mixture and reliability under the most exacting conditions.

MANUFACTURED AND SOLD IN CANADA BY

CANADA FOUNDRY COMPANY, Limited
Head Office, TORONTO
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

"Galvaduct" and
"Loricated"

CONDUITS

For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U.S. Letters Patent.

Toronto Canada

Britnell & Company
Limited

1127½ Yonge Street, TORONTO

Building, Bridge and Dimension Stone
Cement Lime
Crushed Stone and Builders' Supplies

Office Phone North 665
Evenings North 2107

Quarry and Plant at
Burnt River, Ont.

A New Patent

Road Grader

with Sleigh Runners for
cutting out snow roads.

Best Machine made for the Work
Nothing like it in the Market
This Machine sent out on trial

SEND FOR PRICES AND CATALOGUE

Climax Road Machine Co.

Hamilton, Ontario

Globe Furniture Co., Limited

Our factory is the Most Complete and Modern in Canada for the manufacture of

Fine Hardwood Interior Finish

We are furnishing the Interior Trim for a large percentage of the best Residences, Banks, Churches and other Public Buildings in the country. We also contract for all Carpentry Work. We maintain a high standard of workmanship and material. By specifying our high-grade Fittings, Architects and Contractors are sure of completing the work with satisfaction to themselves and the owner. A million feet of Thoroughly Seasoned Hardwoods always in stock.

Send Plans and Specifications for Estimates

The

Globe Furniture Co., Limited

Toronto Office: 90 Yonge St.
Phone Main 5944

Main Office and Factory: Walkerville, Ont.

The Largest Cities and Smallest Towns use

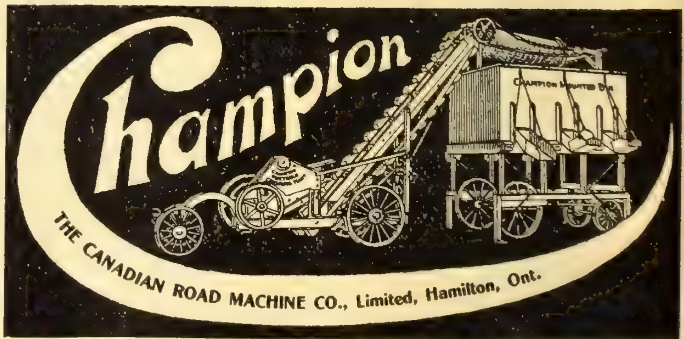
W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name, W. E. Seagrave, guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor-Driven Vehicles of all kinds, our Latest Production.


Champion
Champion Mounted Bin
The Canadian Road Machine Co., Limited, Hamilton, Ont.

The cost of crushing depends on the durability and efficiency of the machine. We would like to submit proofs to convince you that the **Champion Crusher** will do more work and last longer than any other machine made. Catalogue is free.

Have you a contract to let?

Architects, engineers and municipal authorities all know the importtance of securing competitive bids. The most effective way to reach responsible contractors and supply houses everywhere is to invite tenders through the CONTRACT RECORD, known widely as the national medium of tender advertising

Messrs Taylor & Taylor, Architects, Brantford, Ontario, say:—"We consider it the only medium whereby the bulk of responsible contractors may be reached by an advertisement in one paper."

Mr. Cecil H. Robinson, Town Clerk, Walkerville, Ontario, says:—"I consider the CONTRACT RECORD the best advertising medium for tenders for public works owing to the fact that all contractors see it and look for the advertisements."

A modest investment in the advertising of proposals will convince you of the service you can secure from the CONTRACT RECORD. Published weekly. Send for sample copy.

Your instructions should reach office of publication Mondays to ensure advertisement appearing in current week's issue.

Contract Record

Toronto - Canada

Kirkfield Portland Cement Co., Ltd.

Toronto

"Sterling" Brand Cement

A. S. C. E. and Standard specification

CONTRACTORS' SUPPLIES

If you are in need of

Doors
Sash
Frames
Ceilings
Mouldings
Stairs
Hardwood Flooring
(Empire Brand)

just let us know and we will ship your orders promptly. Mixed cars a specialty. We also carry Hemlock and Pine (rough or dressed.)

J. R. Eaton & Sons

Orillia, Ontario

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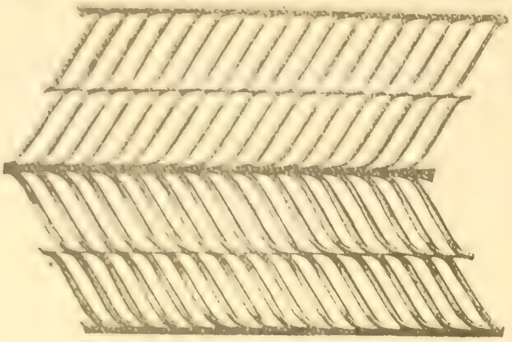

Herringbone Editorials Number Five

Herringbone Metal Lath sales for 1909 as compared with 1908 sales show the following:

An increasingly general use of Herringbone Lath on sixteen inch spans.

A general acceptance of 27 gauge cold japanned as the standard lath.

A remarkable increase in total sales.

The experience of the contractors of Canada is embodied in these three sentences.

A fool will not learn from his own experience. A wise man learns from the experience of others. Be Wise.

CLARENCE W. NOBLE
GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO
Metal Shingle & Siding Co., Manufacturers

Pine Doors

We have long appreciated the fact that price is not the only requiste an architect, builder or contractor must seek in placing his order for doors. Poorly manufactured doors can scarcely be considered a bargain at any price.

Door Making is our Specialty

We have equipped our plant with the best door machinery made, and turn out doors that are right in quality and right in price.

Our doors need no commendation. They prove themselves.

Prompt deliveries. Write for prices.

Wholesale or retail dealers in lumber, doors and trim.

L. A. DeLaplante, Limited
212 Main St., Phone Beach 230 TORONTO

Some Reasons Why You Should Recommend

PRESTON CEILINGS

If you are a progressive builder or contractor we ask you to advise and recommend the use of PRESTON Ceilings for the following reasons :—

First, because we use superior dies and the heaviest drop presses and are thus able to bring out every detail of the design clearly and accurately.
Second, because the joints are easy to fit and become a part of the design. The whole ceiling harmonizes in every particular.
Third, because Preston Ceilings, Walls, Cornices, Mouldings, Centre Plates, etc., are classified so that the designs will match.
Fourth, because Preston Ceilings are fireproof, never warp, crack or fall down, and can be easily washed.
Fifth, because Preston Metal Ceilings cost no more than the ordinary kinds, yet are far more artistic.

Send us your name and address so that we can mail you a copy of our handsome book of Louis XIV, Gothic and Colonial designs.

METAL SHINGLE & SIDING CO., Limited, Preston, Ont.
Branch Office and Factory, MONTREAL, P. Q.

Henry New Robert W. New

Hamilton
Pressed
Brick

has a softness of tone, beauty of texture and uniformity of color that puts it in a class by itself. Be sure you specify this brand for all your Spring work.

Hamilton Pressed Brick Co.

Phone Long Distance, 345 and 2931

HEAD OFFICE

Spectator Bldg., HAMILTON, ONT.

Are You Interested in Good Brick?

Do you want to be known as a fellow who always uses the best? Then in future see that you specify

Port Credit
Brick

It's strong, durable and has a rich red color that will please you beyond all expectations.

We are armed for Spring Orders

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Dry Pressed Brick

The Dry Pressed Brick is the most artistic up-to-date permanent building material on the market. Architects and Contractors agree on this. We are manufacturing best colored, most uniform Brick on the market.

:: :: **Correspondence Solicited** :: ::

Canadian Pressed Brick Co.
Limited

Phone 423 and 2457

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Room 36, Federal Life Building - HAMILTON

Toronto Pressed Brick and Terra Cotta Works

BRICKS

Roofing and Flooring Tiles, Cresting, Finials and Chimney Tops

Send for Samples and Prices. Special and prompt attention given to Architects' Terra Cotta Drawings.

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TORONTO PRESSED BRICK WORKS
Head Office - MILTON, ONT.

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Montreal Agent: E. F. DARTNELL, 180 St James Street
Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

DOMINION BRIDGE CO.
LIMITED

We Build

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

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Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

Manufacturers of

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.
The standard of excellence is marketed in

"Hammer Brand"
Hard Wall Plaster

HARD-WALL PLASTER
HAMMER
BRAND
HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

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Philadelphia, Pa.	Franklin Bank Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

The Hamilton Bridge Works Co., Ltd.

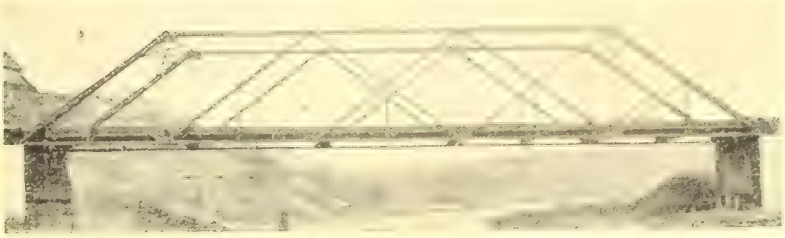
Established 40 Years

Office, HAMILTON CANADA

Capacity 25,000 Tons per annum

Bridges
and
Buildings

Producing Engineers
and Contractors



All kinds of
Structural
Steel and
Bridge Work

Send for Estimate

John B. Smith & Sons
Limited
TORONTO

Pine and Oak
Bill Stuff

In Long and Large Sizes

Interior Woodwork of Superior Quality
for High-Class Buildings

Established 1851

The
Phœnix Bridge & Iron Works
Limited
MONTREAL

General Steel Contractors

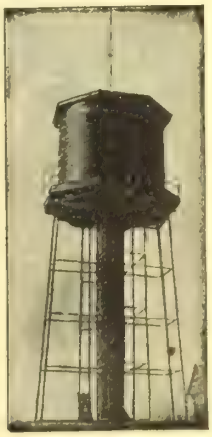
Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

Steel Bridge Contractors

Structural Steel Contractors

SPECIFICATIONS SOLICITED

Corbet Foundry & Machine Co., Owen Sound, Ont.



Steel and Wood
TANKS

Suitable for Sprinkler Systems
Fire Protection, Water Supply
Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

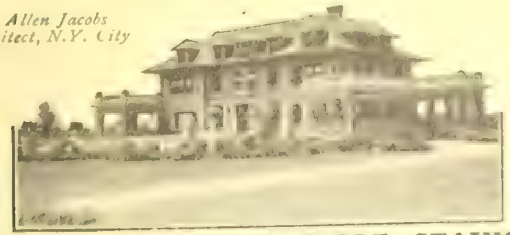
Windmills, Gasoline Engines,
Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Showing construction of Mail Job Printing Co's. building, cor. Adelaide and Duncan Streets, Toronto—Leach Concrete Co., Contractors.
We are contractors for Stable Floors, Tanks and Construction Work of all kinds. Write to

LEACH CONCRETE CO., 100 King Street West, Toronto

Harry Allen Jacobs
Architect, N.Y. City



Stained with **CABOT'S SHINGLE STAINS**

For shingles, siding and other exterior woodwork.
Cabot's Sheathing and Deafening Quilt.
The warmest sheathing and the perfect [illegible]
Waterproof Cement and Brick Stains, Conservo Wood Preservative.

SAMUEL CABOT, Inc., Sole Manfrs., Boston, Mass., U. S. A.

Canadian Agents
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Alsip Brick, Tile & Lumber Co., Winnipeg

International Varnish Co.
TORONTO Limited

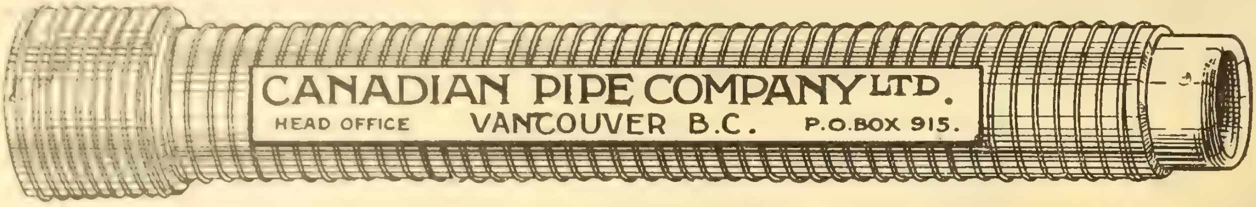
MANUFACTURERS OF HIGHEST GRADE

Architectural VARNISHES

Branch of Standard Varnish Works

New York Chicago London Berlin Brussels

S. S. SELMAN, President
A. G. McGREGOR, Gen. Manager

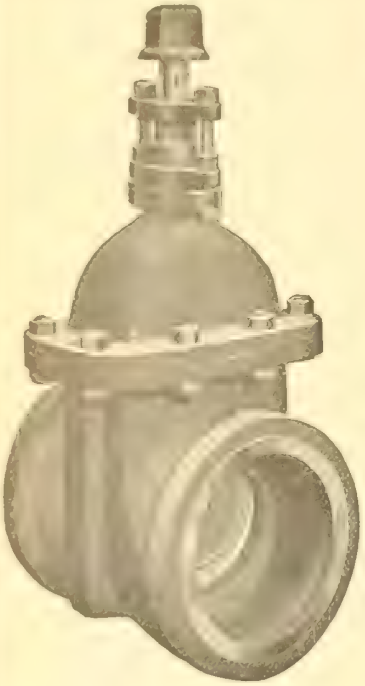

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.



KERR

Water Gates

Fire Hydrants

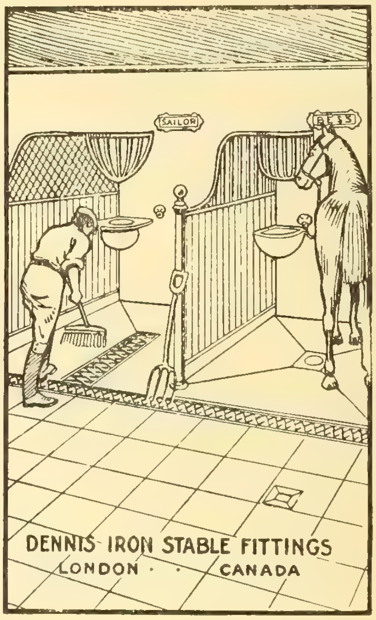
Valve Boxes

Valves

for city and town waterworks are of the latest designs.

The Kerr Engine Company
Limited
Valve and Hydrant Manufacturers
WALKERVILLE, Ontario

The Modern Stable



Our Iron Stable Fittings give the stable a modern attractive appearance, make it wholesome and sanitary—and they never wear out.

We make a special feature of this line and quote prices that make it possible to furnish a stable in a complete and up-to-date way at a very moderate cost.

Send for Special Booklet and Price List.

The
Dennis Wire & Iron Works Co.
London, Canada Limited
Toronto Office: 103 Pacific Building

[illegible] Thomson, President. J. G. Allan, Vice-President. James A. Thomson, Secretary. Alex L. Gartshore, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

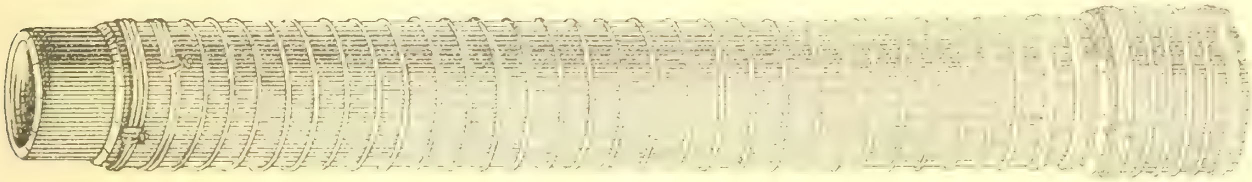
Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

Wood Stave Pipe Galvanized Wire Wound and Continuous Stave Pipe for Waterworks, Power and Irrigation, etc., etc.

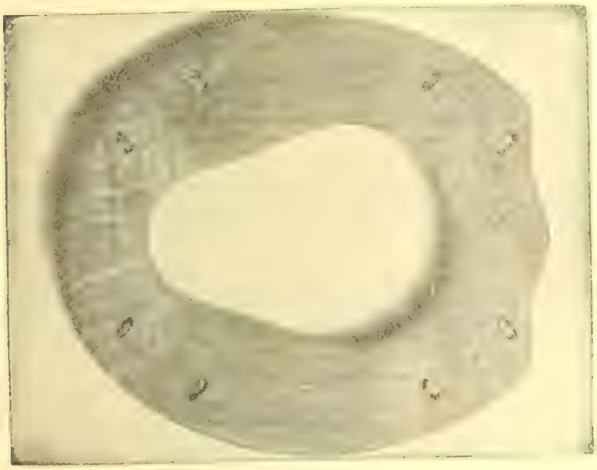


DURABLE, ECONOMICAL, and NOT affected by RUST, CORROSION and ELECTRICITY and is practically FROSTPROOF. Prompt attention to all enquiries. Write for catalogue.

THE DOMINION WOOD PIPE CO., Limited - New Westminster, B. C.

"Never-Split" Closet Seat

If the simple idea of this seat was not protected by Canada, every manufacturer of closet seats would be placing the Never Split Idea into his products.

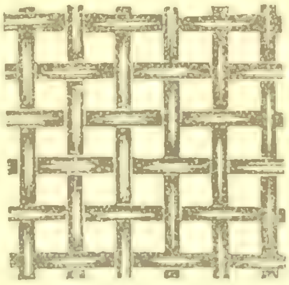


They embody sanitary perfection, style and lasting qualities found in no other seat. Cannot come apart or split and are rendered absolutely rigid by steel bolts at each joint.

Goderich Organ Co., Limited Goderich Ontario

Canada Wire Goods Mfg. Co.

Hamilton



Manufacturers of

Double Crimped Wire Cloth and Wire Screening

for all purposes of Steel, Iron, Brass, Copper, Bronze, Galvanized and Tinned Wire, etc.

There is no kind of Wire Fabric required in the production of any machine or manufactured article that we cannot furnish.

We also manufacture

Bank and Office Grilles and Ornamental Iron Work in all finishes

Jail and Prison Metal Construction, Wire Lockers, Riddles, Laboratory Testing Sieves and General Wire Work of every description.

Send for Catalogue
Inquiries solicited

The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

[illegible]

The Canada Iron Corporation
Limited

Montreal, Que. Three Rivers, Que. St. Thomas, Ont.
Hamilton, Ont. Midland, Ont. Fort William, Ont.
Londonderry, N.S.

The Last Word in Wire Lathing

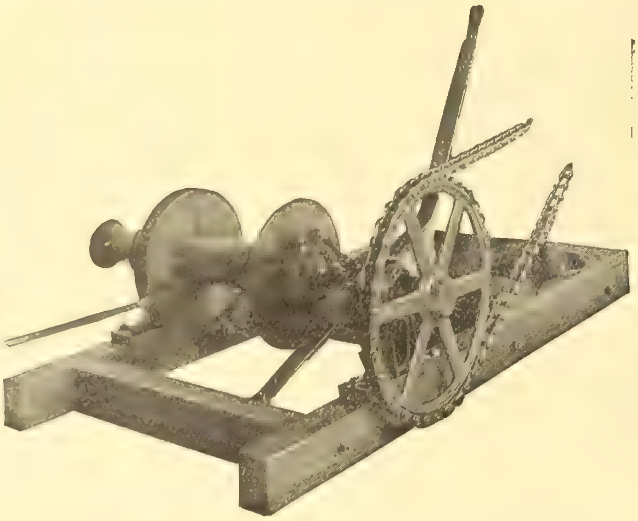
1910 **Patented Trussed** 1910

Wire Lath

FOR DESCRIPTION AND PRICES
APPLY THE MANUFACTURERS

The B. Greening Wire Co.
Limited
Montreal, Que. - Hamilton, Ont.

"London"
Friction Clutch Hoist



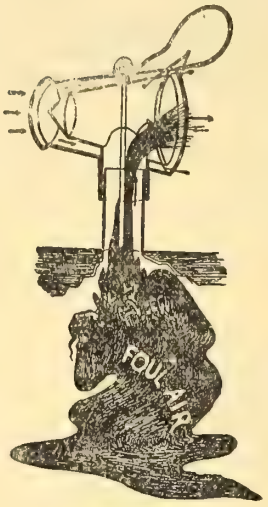
We have designed and perfected a hoist that would meet the demand for a simple and durable hoist at a moderable cost. The "London" is a powerful hoist for use with any style of Gas, Gasoline or Oil Engine.

The Scott Machine Company
Limited
Engineers and Machinists London, Canada

Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO

AUTOFORCE VENTILATING SYSTEM



(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

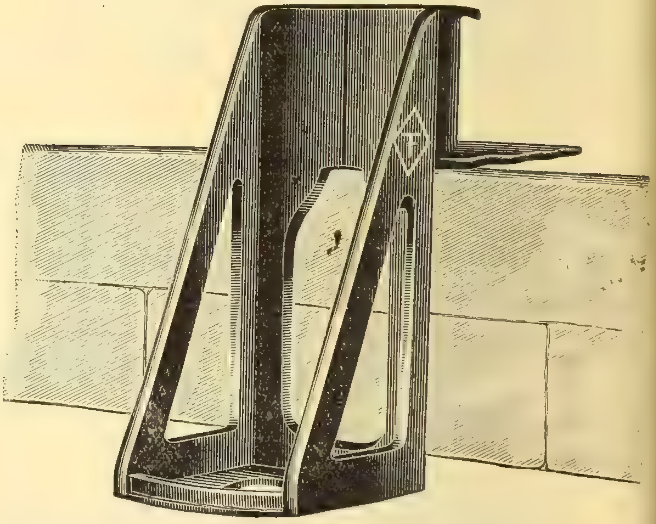
SOLE LICENSEES AND MANUFACTURERS FOR CANADA:

Gardiner & Gaskill, 505 Power Bldg., Montreal, Que.

Telephone Main 159

Builders' Joist Hangers

ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalogue we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE.

ESTIMATES FURNISHED

TAYLOR-FORBES COMPANY, Limited
GUELPH, ONTARIO

The Municipal Construction Co.

Limited

Contractors for
Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced Concrete Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

Roman Stone

is the oldest and yet the most modern building material. It was used in important old Roman work and is being used in many up-to-date buildings to-day.

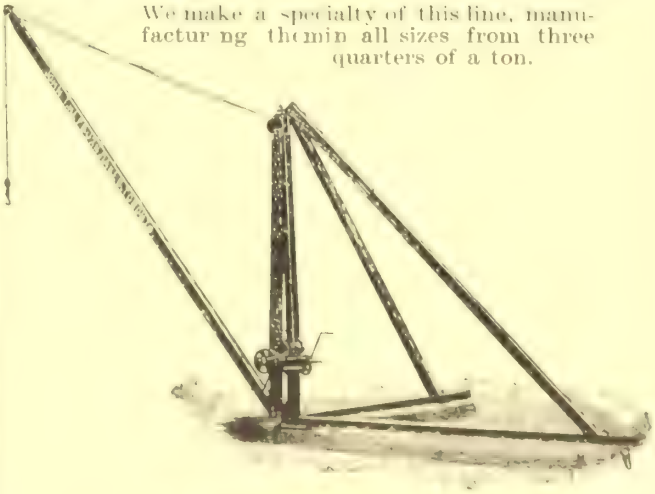
ROMAN STONE is made from pure white marble and machine tooled after casting.

Any Size, Shape and color

The Roman Stone Co.
Limited
100 Marlborough Avenue - Toronto

Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

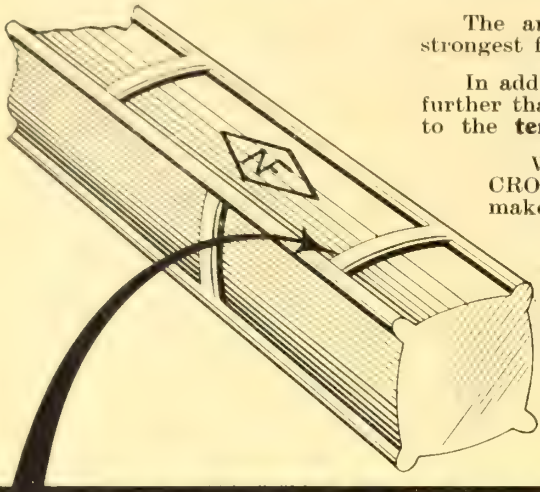
Write us for particulars about the "Little Wonder" Cement Block Machine and the "New State" Concrete Mixer.

JOHN T. HEPBURN
18-34 Van Horne St., Toronto, Canada

It Adds to Strength and Lessens Strain

Here is a cut of a section of the

"NF" Reinforcing Bar for Concrete



The arrow points out the **longitudinal rib** which is one of its very strongest features.

In addition to the usual advantages claimed for deformed bars, we claim further that the **longitudinal ribs** on the four corners of the (NF) Bar add to the **tensile strength** and prevent **torsional strains** in the concrete.

We have proven this to be an established FACT. In addition the CROSS RIBS form a mechanical bond, so that less metal is required to make a PROVEN BOND under OURS than under any other system.

Does this mean anything else than a SAVING in COST, not only in the **first instance** but so long as the **building will stand?** Is it possible to figure the case out in any other way?

We should like to send you some literature on this point, may we?

ONTARIO IRON & STEEL CO LIMITED TORONTO CAN.

We Manufacture

Frames - Sash - Doors
House Trim

Finest Quality Hardwood Flooring
High Class Interior Work :: ::

OUR ARGUMENTS FOR SOLICITING YOUR BUSINESS ARE EXCELLENT.

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity.
New and well equipped factory with latest and best machinery.
Experienced workmen under the most expert supervision. ::

GIVE US A TRIAL ORDER OUR WORK WILL CONVINCE YOU

Georgian Bay Shook Mills, Limited
Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Halifax, N.S.

Tenders for $20,000 30-year 4 per cent. debentures are being received until March 9th for the purpose of building sewers.

Medicine Hat, Alta.

The council has decided to spend over $60,000 this season in extending the sewerage system and cement walks.

Orillia, Ont.

Tenders are being called by the town clerk until March 7th for sewage pumping machinery. For further particulars see advertisement in this issue.

Cttawa, Ont.

Among the estimates prepared by City Engineer Ker are the following: Repairing pavements, $10,000; road maintenance and repairs, $30,000; new macadam roads, $20,000; bridge repairs, $3,600; concrete walks, $3,000; plank walks, $2,000; sewer main, $5,000. Waterworks—Old acqueduct, (renewing piers), $4,000; renewing old services, leaks, thawing, etc., $10,000; laying new services, $15,000; renewing and repairs to hydrants, $3,500.

Port Arthur, Ont.

The council plans an extensive paving programme with the opening of the construction season. All streets in the business section of the city are to be renewed.

Saskatoon, Sask.

The city will spend $90,000 in waterworks and $110,000 on sewer extensions.

Thorold, Ont.

Tenders will be received until February 26th for the purchase of $3,573 20-year 5 per cent. sewer debentures, issued under Local Improvement Act. D. J. C. Munro, town clerk.

AWARDED.

Ottawa, Ont.

Newton J. Ker, City Engineer, writes that the contract for the supply and delivery of 3,000 lineal feet of 42 inch intake pipe has been awarded by the Waterworks Committee to the International Marine Signal Company of this city for $17,290.

Toronto, Ont.

The Board of Control awarded the contract for the construction of the outfall sewer, in connection with the sewage disposal works to Mr. F. H. Dickenson, of Hamilton, for $125,504. The Constructing & Paving Company, of Toronto, also tendered, but withdrew before the tenders were opened. Their price was $104,900, or $20,604 less than Mr. Dickenson's. The Canada Foundry Company was awarded the contract for special castings needed in connection with the plant, but the pipes, valves, cranes, etc., will be supplied by English firms.

Vancouver, B.C.

George Ledingham was awarded the contract for laying ten miles of cement sidewalks at 12 1-2 cents a square foot. This is half a cent higher than last year's rate. Other tenders were: McEachern & Richardson, 13 1-2 cents; D. G. McKenzie, 13 1-2 cents, and 14 cents for walks over 6 feet wide; Palmer & Henning, 13 1-3 cents. Tenders for three years' supply of crushed rock ranged from $1.95 to $3.05 a cubic yard, according to length of haul. The city's present contract with the Coast Quarries Company expires about July 1st, and is at $1.75 a cubic yard. The tenders for block paving covered the following sections:—Georgian street, from Burrard to Cardero; Georgia street, Cardero to Chilco; Burrard street, Hastings to Robson; Howe street, Robson to Nelson; Beatty street, Pender to Georgia. The prices were as follows: M. P. Cotton, wood blocks, Georgia street, first section, $59,392; second section, $39,400; Burrard street, $55,950; Howe street, $8,232; Beatty street, $22,427. Palmer Bros. & Henning, wood blocks, Georgia street, first section, $55,791; second section, $37,729; Burrard street, $53,917; Howe street, $7,685; Beatty street, $20,620. T. R. Wickson & Company, wood blocks, Georgia street, first section, $57,484; second section, $36,443; Burrard street, $55,108; Howe street, $7,893; Beatty street, $21,625. Hassam Paving Company, Hassam concrete pavement, Georgia street, first section, $52,413; second section, $36,913; Burrard street, $48,494; Howe street, $7,153; Beatty street, $19,326. M. P. Cotton, concrete pavement, Georgia street, first section, $64,189; second section, $42,083; Burrard street, $60,773; Howe street, $8,954; Beatty street, $23,547. Palmer Bros. & Henning, granolithic pavement, Georgia street, first section, $68,663; second section, $47,433; Burrard street, $66,470; Howe street, $9,638; Beatty street, $24,849. R. S. Blowe Company, granitoid pavement, Georgia street, first section, $59,076; second section, $41,588; Burrard street, $56,655; Howe street, $8,308; Beatty street, $21,748. Palmer Bros. & Henning, bitulithic on concrete base, Georgia street, first section, $71,310; second section, $52,733; Burrard street, $69,450; Howe street, $10,108; Beatto street, $25,662. Warren Construction Company, Georgia street, first section, $59,793; second section, $46,345; Burrard street, $57,424; Howe street, $8,357; Beatty street, $21,212. Warren Construction Company, bitulithic on bituminous base, Georgia street, first section, $55,258; second section, $44,025; Burrard street, $52,949; Howe street, $7,704; Beatty street, $19,577. The pavement tenders were referred to City Engineer Clement to be considered at next meeting.

Railroads, Bridges and Wharves

Brockville, Ont.

[illegible]

Chapleau, Que.

It is reported that bids will be received until [illegible] by the Department of Public Works, Ottawa, Ont., for constructing piers, abutments and approaches for a highway across the Culbut Channel of Ottawa River.

New Westminster, B.C.

The residents of Annacis Island are anxious to secure a $40,000 bridge to connect their island with Lulu Island.

Ottawa, Ont.

It is understood that the Government has decided to grant a subsidy toward the construction of a dry-dock at Sault Ste. Marie. Cost, $600,000.

St. John, N.B.

The Board of Trade have passed a resolution urging the building of the Valley railway from Grand Falls to St. John along the western side of the river.

St. Thomas, Ont.

County Engineer Bell is preparing plans for the construction of a steel and concrete bridge 16 feet wide, with sidewalk, at Port Burwell, and for a concrete bridge in Southwold to replace Dodd's bridge on the L. & P. S. gravel road, north of the city.

St. Johns, Nfld.

At a recent meeting of the Board of Trade of Montreal, Que., a letter was read from the Trade Commissioner for Newfoundland, stating that the Reid Newfoundland Company was building 250 miles of railway, and it was understood that the rails would be laid in the spring. It was also understood that the locomotives and the necessary rolling stock would be built by the Reid Company. The letter went on to state that the commissioner would like to see Canada secure some of these orders.

Toronto, Ont.

Surveyors have been put at work by the G. T. R. west of Strachan avenue in preparation for the depression of the tracks to Sunnyside and the elevation of them from there to the Humber, as recently ordered by the Railway Commission.

AWARDED.

Fredericton, N.B.

Hon. John Morrissy, Chief Commissioner of Public Works, has awarded a contract for the substructure of the new Shediac bridge to Julien S. Fournier, of Shediac. The contract price is between $6,000 and $7,000.

Hon. John Morrissy, Chief Commissioner of Public Works, has awarded the contract for the Starkey bridge, Parish of Johnston, Queen's County, to [illegible] of St. Mary's. The contract [illegible] vicinity of [illegible]

Toronto, Ont.

The contract for the [illegible] over the North [illegible] has been awarded to the Hamilton [illegible] Company by the Commissioners of the [illegible] Railway.

Winnipeg, Man.

The J. D. McArthur Company [illegible] the contract from the Grand Trunk Pacific for the sixty miles of the [illegible]

Melville branch from Balcarres to Regina. The same firm has secured the balance of the Tofield Calgary line, a distance of 135 miles. Both contracts are to be finished by the end of October 31, and the company will have the tracks ready for operation by the end of this year.

Tenders were received by the Board of control yesterday for the steel superstructure of the Louise bridge. The following firms bid for the contract:—Canadian Bridge Company, $123,500; Algoma Steel Bridge Company, $126,216; Dominion Bridge Company, $147,400; Wm. Jacks & Company, $164,415; Cleveland Bridge & Engineering Company, $193,898. The Canadian Bridge Company make a note that they require piers to be lengthened and widened, at an additional cost, which brings their tender up to $131,165. The Dominion Bridge Company make the same requirement, bringing their tender up to $153,274. The location of machinery by the Algoma Steel Bridge Company would require to be altered and moved from the top of the pier where they designed it, to a cabin over the roadway. The extra cost of this would add $250, bringing their tender up to $126,466. The requirement of larger piers asked for the Canadian Bridge Company might be overcome, but there is another objection to their design, in that the strain sheets of the trusses show that there is not quite sufficient material to comply with the city's specifications. The amount of steel provided for in the tender of the Canadian Bridge Company is 900 tons; that of the Algoma Steel Bridge Company, 938 tons, exclusive of tracks and floor reinforcements. If it is not required to keep traffic going during the erection of the bridge, a deduction of $3,000 to $4,000 should be made from the cost. The board recommended the award to Algoma Steel Bridge Company.

Public Buildings, Churches, Schools, etc.

Brandon, Man.
The plans prepared by Thos. Sinclair, architect, for the new church to be erected by the congregation of St. Mary's have been accepted. They call for a building 104 feet long by 50 feet wide.

A committee composed of Messrs. J. Hanbury, R. Darrach and others was appointed to look into the matter of a new wing to the hospital or that of alterations, which would cost about $17,000.

Cobourg, Ont.
The offer of Mr. Harry Black, of New York, to give $10,000 towards the new hospital has been accepted by the joint boards of the town council and board of trade.

Chilliwack, B.C.
Tenders addressed to J. N. Ashwell, city clerk, will be received until February 28th for the purchase of 10-year $4,500 school debentures, 5 1-2 per cent.

Eganville, Ont.
J. R. Campbell, secretary, will receive competitive plans and specifications for an eight-room school house with basement, plans to provide for heating and ventilating. Price of plans, $75. Proposed cost of building from $10,000 to $12,000.

Fergus, Ont.
Tenders have been called for the removal of the building occupying the site for the proposed new library on St. Andrew street. P. Perry, secretary-treasurer, Library Board.

Fraserville, Que.
The Town Hall was destroyed by fire on the 16th inst. Total estimated loss, $25,000.

Fernie, B.C.
Ald. Cree, of the city council, has given notice of a by-law to amend the fire limit by-law so that the Dominion Government may erect a frame drill hall.

Fonthill, Ont.
Arrangements are being made for the construction of a four-room school house at a cost of $8,500.

Flesherton, Ont.
W. J. Bellamy, secretary, will receive competitive plans and specifications for an eight-roomed school house, with basement, and also plans and specifications for a four-roomed school house, with basement, plans to provide for leveling and ventilation, for "Artemesia Rural High School." For the eight-room building the board will pay $60, and for the four-room building $35. Competitors to give approximate cost, exclusive of furnishing. Proposed cost of eight-room building from $10,000 to $14,000, and four-room building from $8,000 to $10,000.

Halifax, N.S.
The new naval college which is to be built in connection with the Government's naval scheme at a cost of $150,000 will, it is understood, be located at Halifax, as will also be a barracks for staff, etc., at a cost of $200,000 and possibly an admiralty dockyard at an estimated cost of $100,000.

Hamilton, Ont.
It is stated that the new east end police station will be situated at the corner of Barton street and Kinrade avenue.

The Board of Hospital Governors is said to be planning the erection of a 3 storey addition to the Nurses' Home, the cost to be $23,000.

Architects are invited to submit plans, etc., for a new public library here. Plans to be delivered not later than April 16th. For further information apply to Adam Hunter, secretary, Public Library Board.

London, Ont.
The financial committee have decided to obtain plans for a new registry office and also estimates of the probable cost of improvements. Noted in issue of January 19.

It is stated that Hamilton Road Presbyterian Church will build a new church at a cost of about $10,000. Mr. E. Bourne, 423 Hamilton road, chairman of Board of Managers.

It is understood that the erection of King Street Presbyterian Church will be commenced within a year or so, and that a new site, on either Dundas street or Queen's avenue, in the east end, will be secured. Pastor, Rev. Mr. Rollins.

Lakeview, Ont.
Tenders addressed to John A. Saxton, chairman, building committee, will be received until February 23rd for the erection of Baptist church. Plans, etc., at office of Thomas Wooster, architect, Aylmer, Ont.

Minnedosa, Man.
Tenders will be received by the trustee board of the Methodist church until February 26th for the erection of a two storey brick veneer parsonage. Specifications at post office. Harvey Armitage, secretary-treasurer.

Montreal, Que.
The Royal Arthur School, Canning street, sixteen class rooms is under the supervision of A. F. Dunlop, Lindsay Building, and is to be completed by August next.

The Art Gallery on Phillips Square, it is stated, has been sold to Mr. James Maher, contractor, 57 Guardian Building.

The Board of Commission of the Montreal Technical School have deferred action in the matter of awarding the contract for the heating and ventilating and power equipment for the Technical School.

Mr. Theo. Daoust, architect, 103 St. Francois Xavier, is receiving tenders this week for the construction of buildings for the amusement enterprise at Isle Grosse Bois.

MacDuff & Lemieux, architects, 212 Merchants Bank Building, have been appointed to draw plans for a new church building and Presbytery for the Parish of St. Zotique, St. Henri.

It is stated that a Normal School for training of Roman Catholic teachers will be erected on the southeast corner of Atwater avenue.

New Westminster, B.C.
The Provincial Government has given one and a half acres of land on Lulu Island to the school board for use as a site for the proposed new school in that district. Chairman, T. J. Trapp.

Owen Sound, Ont.
The scheme to sell town hall and build a new one on west side is said to be favorably considered by the citizens.

Ottawa, Ont.
The Salvation Army has decided, if practicable, to build a rescue home.

W. N. Noffke, architect, is receiving tenders for extensive alterations to the basement of the Central Chambers.

Port Arthur, Ont.
Tenders are being called until February 28th for the erection of a Masonic temple, exclusive of heating, plumbing and wiring; the building to be completed by 1st of September. Plans, etc., at office of M. B. Aylesworth, architect, 27 Cumberland street.

Phoenix, B.C.
The board of trustees have petitioned the Provincial Government for a grant of $10,000 towards a new school. Ernest Miller, M.L.A. for Grand Forks, is interested.

Princeton, B.C.
The committee appointed by the Board of Trade to take initial steps toward the erection of a general hospital, report that a site of six lots has been donated by the Vermillion Forks Company. Secretary-treasurer, Board of Trade, H. H. Avery.

Penetanguishene, Ont.
C. J. Vicotte, Chairman County Property Committee, writes that the tenders for heating jail in Barrie will not be called for a while, alterations in plans being necessitated.

Regina, Sask.
It is stated that the Methodists will establish a college here to cost $250,000.

Riviere du Loup, Que.
The City Hall was completely destroyed by fire on the 16th inst. Loss, $30,000.

St. Thomas, Ont.
The citizens have contributed $5,000 towards the erection of a new Y. M. C. A. building on condition that the committee raise $40,000. A canvas will be made. The present site will be used.

St. John, N.B.
The survey for the new exhibition building was made recently. Extent, 60 x 100 feet. Mr. Good, manager.

Smith's Falls, Ont.
G. T. Martin, architect, has prepared plans for the new general hospital, which will call for an expenditure of about $18,000, including heating.

Toronto, Ont.
The Board of Education are calling for tenders until the 25th inst. for masonry and plastering in the erection of Logan Avenue School. For further particulars see advertisement in this issue.

The trustees of Bathurst Street Methodist Church have approved of plans for a modern Sunday School structure to be built on the site of the present school, on which work will begin next spring. Cost, about $25,000.

Plans and specifications for the police station and fire hall at the corner of Main street and Swanwick avenue, and for the fire hall at the corner of Howland avenue and Dupont street, are to be prepared as soon as possible by the City Architect. The cost of the former building is to be $28,000 and the latter $27,000.

Wm. Morris, manager of the Majestic Theatre and head of the Morris vaudeville circuit, has leased a property on Yonge street, just north of Queen. A modern theatre building will be erected.

It is rumored that a new company has been formed and that options have been secured on houses on Wood street, on which an arena will be built.

Victoria, B.C.
A club house is being erected for the members of the Empress Athletic Club.

A modern athletic club house is being constructed on the foreshore of Shawinigan Lake in the vicinity of Koenig's Hotel. Estimated expenditure, $10,000. S. Heald is interested, also the James Bay Athletic Association.

Vancouver, B.C.
The Board of Works have decided to erect an incinerator to cost $70,000. Tenders are to be called at once.

W. A. Leech, schools architect, will be asked to prepare plans for two new buildings on the Mount Pleasant school grounds. The by-law is being prepared.

An automobile club is being organized, and a club house proposed to be built near the international boundary line on the sea coast. Several plans have been submitted by city architects.

Whitby, Ont.
Mr. Robert Findlay, architect, 10 Phillips place, Montreal, Que., has completed plans and specifications for a Nurses's Home to be erected in Whitby, Ont. Tenders are being received by Mr. J. D. Flavelle, Lindsay, Ont.

Walkerton, Ont.
The members of the English Church have decided to erect a new church on Colborne street. Work will be started in the spring. Estimated expenditure, $8,000.

Woodville, Ont.
The Methodist church here was almost completely wrecked by an explosion on the 16th inst.

Winnipeg, Man.
Among the recommendations made by the University Commission is one for the establishment of an engineering college and a college of domestic science.

A large colored drawing of the proposed provincial university buildings has been placed in the window of Hart's book store, by Mr. Heubach, of F. W. Heubach, Limited, showing how the 160 acres he is willing to deed to the government for this purpose can be laid out.

AWARDED.

Guelph, Ont.
The tender for the electric wiring of the new Forsyth-Hepburn Nurses' Home has been awarded to Mr. Clarence Noice, of this city.

Moncton, N.B.
The contract for overhauling the Davidson theatre has been given to Arthur LeBlanc. Summer Company have charge of the installation of the boilers, radiators, etc.

Ottawa, Ont.
J. Herbert George, architect, has awarded to Alex. Christie, contractor, the bulk contract for the new theatre to be erected on Queen street. Estimated cost, $30,000.

Messrs. Horwood & Taylor, architects, have awarded the bulk contract for the erection of the new golf club to H. C. Hitch, 98 Commercial Union Building, Montreal. Estimated cost, $45,000.

Sarnia, Ont.
W. D. Giffin has been awarded the contract for the new club house for the Sarnia Golf Club.

Stratford, Ont.
T. J. Hepburn, architect, writes that the following tenders have been awarded for the addition to the General Hospital:—Foster Clase, mason work; Wm. Daly, carpenter work; L. Hassell, plastering; A. O. Neff, painting and glazing; McDonald & Henry, plumbing, steam heating, gas fitting, metallic lathing and ventilation; Parkin Elevator Company, for hudraulic elevator and dumb waiter; F. Entrican, contractor for supply of bricks. The combined tenders amount to $20,786.

Residences

Montreal, Que.
Tenders were received up to the 23rd inst. for the erection of a residence on Roslyn avenue, Westmount, for Mr. G. H. Bishop. Mr. Robert Findlay, architect, 10 Phillips place.

Toronto, Ont.
Tenders will be received until March 7th for the various trades required in the erection of a residence on Oriole road. Plans, etc., at office of the architects, Darling & Pearson, 2 Leader Lane.

Victoria, B.C.
Judge Galliher will erect a residence on the southwest corner of Rockland avenue and St. Charles street. Estimated expenditure, [illegible]

Vancouver, B.C.
A. Campbell Hope, architect, has prepared plans for R. M. Edgar for a new six storey apartment house on Beach avenue between Jervis and Bute street, extending back to Pacific. Dimensions, 130 feet on Beach and 127 on Pacific. Materials, brick and stone. Estimated cost, $175,000.

AWARDED.

Montreal, Que.
[illegible] heating of a residence on Cedar avenue, for Mr. J. Earl Birks, has been awarded to John A. Gordon, 301 St. Antoine street. Geo. T. Hyde, architect, 157 St. James street.

Chas. W. Steele, lumber merchant, Beth[illegible] has sold [illegible] Company, Limited.

Business Buildings and Industrial Plants

Brandon, Man.
The ratepayers will vote on the 28th inst. on the agreement between the city and the C. N. R. re the new hotel.

Calgary, Alta.
The C. T. Reineck Company, Portland, Ore., according to reports, has decided to build a plant at East Calgary for manufacture of stoves and kitchen ranges. Estimated cost, $100,000.

Digby, N.S.
It is stated that the executors of the Nichols estate intend erecting a business block on Water street, opposite the D. A. R. station.

Dunnville, Ont.
The by-law to authorize a loan of $30,000 to the Canadian-American Gas & Gasoline Company was carried. By the agreement the company will erect a foundry and machine shop to cost $45,000.

Durham, Ont.
It is stated that the Furniture Company will erect a chair factory here in the near future.

Galt, Ont.
It is reported that a new shoe factory will be established here in the near future. Dr. J. H. Radford and Mr. Stewart are interested.

Humberstone, Ont.
A new bank building is to be erected on the site purchased some time ago by the Imperial Bank.

Hamilton, Ont.
W. H. Cooper has taken out a permit for the erection of an addition to the wood room of the International Harvester Company, to cost $7,500.

Kingston, Ont.
The City Council and Board of Trade are considering an offer of D. Roy Smith, of Boston, regarding the erection of an hotel on the Carruthers site on King street, to cost not less than $250,000.

Kincardine, Ont.
The Bank of Hamilton will erect new premises here.

London, Ont.
The London Rag & Metal Company's premises were damaged by fire to the extent of about $6,000.

Lethbridge, Alta.
Superintendent Taylor, of Medicine Hat has announced that the C. P. R. will double the station here at a cost of about $35,000.

Montreal, Que.
Tenders are being received by Mr. Alphonse Piche, architect, 52 Victoria square, for the fittings required for the new cafe in the Banque Nationale, corner St. James and Place D'Armes square.

Plans are being prepared by Messrs. Finley & Spence, architects, 74 Guardian Building, for an [illegible] addition to the factory of the Crescent Manufacturing Company, corner Inspector and William streets. The new building [illegible] by the fall.

It is stated the H. Kellert & Sons, 351 St. James street, have bought the corner of St. Catherine and St. Urbain streets for a factory site.

It is stated that the new store will be enlarged to eventually take in the entire [illegible] bounded by St. Catherine, University, Burnside and Union avenue. Plans are well under way. A. F. Dunlop, Lindsay Building, architect. Estimated expenditure, [illegible]. Noted in issue of January 26.

New Westminster, B.C.

Kelly, Douglass & Company, of Vancouver, are reported to be negotiating for a business site here for their lower Fraser valley wholesale grocery trade.

Orillia, Ont.

It is stated that the Tudhope Carriage Company purpose manufacturing automobiles, and that they will erect an addition to their present factory for that purpose.

Ottawa, Ont.

S. M. Rogers & Son have purchased property on the north side of Rideau street near the corner of Cumberland, on which they will make improvements.

Hugh Carson Company, Limited, whose store on Rideau street was destroyed by fire, have secured premises on the corner of Elgin and Queen streets, which they will remodel for their business.

Prince Rupert, B.C.

It is reported that a smelter with a 250 ton capacity will be started shortly.

Prince Albert, Alta.

Sturgeon Lake Lumber Company will move their mill to a point two miles up from the mouth of the Red river. A. J. Bell is in charge of arrangements.

St. John, N.B.

The A. E. Hamilton woodworking factory, recently destroyed by fire, is being erected on a larger scale. Dimensions, 80 x 100, and two storeys in height.

The shipchandlery establishment owned by Mrs. Wilson was damaged to the extent of about $2,000.

Strathcona, Alta.

A company is negotiating with the municipality as to a site for a plant to manufacture sewer pipe. J. A. McDougall, M.P.P., and S. H. Smith, Edmonton, are interested.

Toronto, Ont.

The construction of the 59-ton ice manufacturing plant under contemplation may not be erected this season, owing to the large supply of natural ice. H. J. Fairchild, secretary, Lake Simcoe Ice Supply & Cold Storage Company, 43 Esplanade east.

The Gurney Foundry Company has purchased property at 740 and 742 Yonge street, Toronto, for $30,000, on which they will erect a retail branch store and warehouse.

Mr. Joseph E. Thompson, Commissioner of Industries, is negotiating with a French firm of steel manufacturers, who desire to establish a plant in Canada. They require a site of about 300 acres.

Vancouver, B.C.

W. Marburry Somervell, whose head office is in Seattle, has prepared plans for Mr. W. A. Bauer, provincial land surveyor, for a large eight storey building on the corner of Howe street and Hastings. Materials, reinforced concrete, with creamy white terra cotta and light sienna colored brick. The interior decorations will be of the best. Mr. F. F. Adams is in charge of the cement work, being the local representative of the Ferro Construction Company, of Cincinatti.

Separate or bulk tenders are wanted for the erection of a brick block on Harris street for Mr. Geo. Kine. E. E. Blackmore, Architect, Leo Building.

Victoria, B.C.

It is reported that A. E. Todd is planning to erect an office building on the corner of Cook and Fort streets, opposite the building now being erected by him. Estimated expenditure, $10,000. Work will not likely commence for a couple of months.

Walkerville, Ont.

It is stated that the Dominion Motor Company, recently organized, will locate here. Work will be started on the new plant in a short time. The company plans to open a branch in Edmonton to handle the cars manufactured here.

Winnipeg, Man.

J. N. Semmens, Union Bank Building, is the representative of McKim, Mead & White, of New York city, the architects in charge of the new Bank of Montreal branch. Work will be commenced and the building housed in by next winter, when interior work will be started.

AWARDED.

Kenora, Ont.

The contract for the erection of a branch building of the Imperial Bank has been let to William Garson, contractor, of Winnipeg. The building will be constructed of white stone and will cost about $35,000. Work will be started as early as possible. Architects, Darling & Pearson, 2 Leader Lane, Toronto.

St. Boniface, Man.

The Western Canada Flour Mills Company have let the contract for their plant here to George H. Archibald & Company, engineers and contractors, at an approximate cost of $250,000. Work will commence in two weeks, and it is expected that the plant will be completed by September.

Winnipeg, Man.

The Bank of Montreal have awarded to the Dominion Bridge Company, of Montreal and Winnipeg, the contract for steel and iron work on their new building. Price, over $50,000. Between 600 and 700 tons will be used.

Victoria, B.C.

The contract for the reinforced concrete building on the corner of View and Douglas streets has been awarded to G. Masher by J. A. Sayward. Estimated cost, $65,000 to $75,000.

Power Plants, Electricity and Telephones

Edmonton, Alta.

Tenders are being called by the Department of Public Works for the supply of whole or any part of the required estimate of material for telephone construction. List of material, etc., on application to the Superintendent of Telephone office, Department of Public Works, Edmonton. John Stocks, Deputy Minister.

London, Ont.

Now that the charter to the London & Lake Erie Railway & Transportation Company (the old South Western Traction) has been granted, construction work on the line from Brantford to London will be commenced this spring. It is the intention that the company shall complete the section from Paris to Woodstock and also from Paris to St. George in the near future.

Ottawa, Ont.

The municipal electric department is calling for tenders until March 1st for supply of meters, transformers, etc. Specifications at office of the electric department. J. E. Brown, superintendent.

Wetaskiwin, Alta.

A by-law to raise the sum of $5,000 for the purpose of improving, extending, etc., the existing municipal electric light and power plant will be submitted to the ratepayers on the 8th of March. E. Roberts, secretary-treasurer.

Winnipeg, Man.

Incorporation is being sought by the Rural Railway Company of Manitoba. The object of the company is to construct, etc., an electric or steam railway and telegraph and telephone line in the city of St. Boniface to connect with a point on the American frontier at or near Emerson, etc. Provisional directors, Dr. Albert Galliot, of Notre Dame des Lourdes; Francois Deniset, Prosper Gevaert, both of Winnipeg. Capitalization, $200,000.

AWARDED.

Fort William, Ont.

The Hinners-Jones Electrical Company of this city has secured the contract to build the four miles of transmission line from the line of the Kaministiquia Power Company to the sub-station in Port Arthur for the Hydro-Electric Commission. It means the building of eight miles of line, for it is to be a duplicate one the entire distance.

Guelph, Ont.

The contract for the equipment for the power station has been awarded to the Canadian General Electric Company.

Nelson, B.C.

Tenders for the supplying of rails, switches and spikes were received by the Nelson Street Railway Company from the following companies: Wood-Vallance Hardware Company, Croasdaile & Company, Dominion Steel Company, and Evans, Coleman & Evans. The tender from the last, being the lowest, was accepted, delivery of rails to be made in three weeks. The contract for poles has been let to Messrs. Knauf & Ogilvie, of Harrop, and the Robson Lumber Company, of Robson, have the contract for supplying ties.

Vancouver, B.C.

Mr. Herbert W. Kent, the British Columbia representative of the Jens Orten-Boving Company, hydraulic engineers, London, Eng., has been awarded the contracts to supply and erect the 9,000 feet of pipe lines and specials for the water from the dam to the powerhouse, required by the Vancouver Island Power Company for its Jordan River plant, at an estimated expenditure of more than $80,000.

Miscellaneous

Cobalt, Ont.

The Peterson Lake Silver Cobalt Mining Company, Limited, call for tenders until February 25th for the enlarging of the present shaft on the island in Peterson Lake, midway between the shaft of the Union Pacific and that of the Susquehanna Mining Company. R. F. Segsworth, secretary-treasurer, 103 Bay street, Toronto.

Hamilton, Ont.

The following list of tenders for the annual supplies was adopted by the City Council:—Portland Cement: Canadian Cement Co., Star Brand at $1.50 per barrel of 350 lbs. at Hamilton, all charges paid, bags to be charged at 10c extra and credited at same figure when returned, freight prepaid. Lime: Oneida Lime Co., 16c per bushel of 70 lbs; E. J. Guest, 16c per bushel of 70 lbs.; supply to be equally divided. :Gravel: Edward New, loaded on wagons at pit, 75c per load of 2 cubic yards. Lumber: M. Brennen & Sons Co., Limited, white pine, $27.75 per M., board measure. Sewer Brick: Ollman Bros., as follows—west of Bay street, $7.75 per 1,000; east of Bay street, $8.00 per 1,000; east of Wentworth street, $8.25 per 1,000; east of Sherman avenue, $8.50 per 1,000. Paving Brick: Massillon Stone & Fire Brick Co., $26.50 per M., f.o.b., Hamilton, duty paid. Iron Castings (ordinary): **Gartshore, Thomson Pipe & Foundry Co.,** $2.05 per 100 lbs. Iron Pipe and Special Castings: (iron pipe) Gartshore, Thomson Pipe & Foundry Co., $34 per ton; (special castings) Gartshore, Thomson Pipe & Foundry Co., $2.75 per 100 lbs. Asphalt: California Asphaltum Sales Agency, $27.25 per ton, f.o.b., Hamilton. Hydrants: Canadian Foundry Co., 150 hydrants at $43.12 each. Sewer Pipe: Hamilton & Toronto Sewer Pipe Company, whatever quantity may be required of the following—size 4, straight pipe, per foot, 5 cents; junctions, each 2 feet, 45 cents; elbows and bends, each, 26 cents; traps, each, 75 cents; stoppers, each, 7 cents; size 6, straight pipe, per foot, 6 cents; junctions, each 2 feet, 54 cents; elbows and bends, each, 33 cents; traps, each $1; stoppers, each 10 cents; size 8, straight pipe, per foot, 12 1-2 cents; junctions, each 2 feet, 78 3-4 cents; elbows and bends, each, 40 cents; traps, each, $2.50; stoppers, each, 17 cents; size9, straight pipe, per foot, 14 2-5 cents; junctions, each 2 feet, 94 1-2 cents; elbows and bends, each, $2.50; size 12, straight pipe, per foot, 25 cents; junctions, each 2 feet, $1.35; elbows and bends, each, $2; size 15, straight pipe, per foot, 37 4-5 cents; junctions, each 2 feet, $2.13 1-2; elbows and bends, each, $2.70; size 18, straight pipe, per foot, 54 2-5 cents; junctions, each 2 feet, $3.06; elbows and bends, each, $2.70; size 20, straight pipe, per foot, 56 1-4 cents; junctions, each 2 feet, $3.14 3-100; elbows and bends, each, $2.70; size 24, straight pipe, per foot, 97 1-2 cents; junctions, each 2 feet, $7.02 6-25; elbows and bends, each, $2.70. Wood Paving Blocks: United States Wood Preserving Co., $1.85 per square yard. Stop and Gate Valves: Kerr Engine Co., 75-6" at $9, each $675; 5-12" at $36, each $180. Lead Pipe: Canada Metal Co., $4.35 per 100 lbs. Pig Lead: Adam Hope & Co., English lead, $3.58 per 100 lbs.; Canadian lead, $3.53 per 100 lbs. Brass Work: The London Brass Manufacturing Co., as follows—50 1 in. couplings, $34.50; 75 1 in. couplings, $146.25; 75 1 in. stop cocks, $99.75; 75 1 in. corp'n cocks, $89; 50 3-4 in. stocp cocks, $39.50; 50 3-4 in. corp'n cocks, $39.50; 1000 1-2 in. comp'n cocks, $840; 75 1-2 in. couplings, $27; 1200 1-2 in. stop cocks, $1,068; 12 1-2 in. stock waste cocks, $11.16; 1,200 1-2 in. corp'n cocks, $564; 50 1-2 in. off 1" branches, $42; 100 1-2 in. comp'n valves, $10; 200 1-2 in. comp'n spindles, $16; 100 1-2 in. back caps, $7; 25 1-2 in. hydrant sliding valves, $6.75; total, $3,000.91.

Montreal, Que.

An order for 140,000 barrels of cement has been received from the Department of Railways and Canals by the Canada Cement Company. This order is the second largest placed this year, the Quebec bridge order only taking precedence.

Recent building permits include:—F. Tremblay, 82 Forsyth, one house containing five dwellings on Cuvillier street, cost $3,500; J. D. Latour, 1200 Mount Royal avenue, two houses containing two dwellings and two stores, cost $6,000; A. Messier, 412 Moreau street, five houses containing nineteen dwellings and [illegible] on Cuvillier street, cost $15,000; Rev. Chagnon, two houses containing seven dwellings on corner Hogan and Forsyth, cost $6,800; G. DeSeres, 97 St. James street, alterations to property, cost $5,000; I. Denis, 1023 Mount Royal, alterations to property at 659 Mount Royal avenue, cost $1,100; E. Braid, 709 St. Lawrence Boulevard, alterations to property, cost $2,500.

Morris, Man.

Tenders will be received until February 25 by the rural municipality of Morris for the expenditure of about $8,000 on grading roads during the year 1910. All tenders to include levelling of grades fit for traffic. D. M. Ure, secretary-treasurer.

Neepawa, Man.

Tenders will be received until March 11th for $4,148, 5 per cent. 20 years local improvement debentures. J. W. Bradley, secretary-treasurer.

Ottawa, Ont.

Recent building permits include:—L Lavigne, brick veneer tenement, Armstrong street, $4,000; James Davidson, fourteen brick veneer dwellings, $25,000; Ottawa Car Company, erecting car shop, iron clad, $3,000; L. F. Fradburks, brick veneer dwelling, Cobourg street, $4,500; W. Shenkman, double brick veneer, iron clad dwelling, Murray street, $2,200; W. Shenkman, three brick veneer dwellings, Rideau street, $3,500; S. Miller and D. Epstein, solid brick addition to shop, Elgin street, $5,000; Geo. Tomlinson, brick veneer dwelling, Thornton street, $2,200; David Biggs, brick veneer dwelling, Florence street, $2,500.

Tenders are being called until February 25th by the Department of Public Works for the supply of oil and grease for the dredging plant.

Tenders addressed to G. J. Desbarats, Department of Marine and Fisheries, will be received until March 7th for the construction of a cribwork pier for a pole light at Grand Entry Harbor, Magdalen Islands. Plans, etc., at Department of Marine and Fisheries, and at the post office, Gaspe.

Tenders addressed to L. K. Jones, Secretary, Department of Railways and Canals, will be received until March 16th for the supply and delivery of B. C. or "Douglas Fir" dimension required for the Rideau Canal. Delivery, 13th of August next. Specifications at office of the Chief Engineer of the Department of Railways and Canals.

Taber, Alta.

Voting on a by-law to raise $15,000 for the purpose of testing for gas and water resulted in the by-law being carried.

Toronto, Ont.

Recent building permits include: S. G. Smith, pair brick dwellings, Gladstone avenue, $4,400; H. Wright, two and a half storey brick dwelling, Roncesvalles and Constance, $3,500; E. G. Switzer, three pair brick dwellings, corner Lynd and Neepawa, $11,500; G. B. Cooney, five detached brick dwellings, near St. Clarens, on Wallace, $10,000; Government of Canada, two storey brick addition to Post Office, Adelaide street east, $43,000; R. C. Bustard, two storey and attic brick dwelling, De [illegible] A. Hobson, brick dwelling, near Barton, on [illegible] and attic brick dwelling, Beech avenue, near Queen, $1,000; Burton & Tucker, one pair semi detached two storey brick dwellings, near Wallace, on Symington, $4,000; [illegible] $4,000; W. J. Pickard, three storey brick addition to warehouse, near McGill, Church street, $3,6000; S. H. Hurst, brick dwelling, Geoffrey, $3,500; Stothers & Kendle, three brick dwellings, Ossington avenue, $6,000; G. H. Anthony, one pair two storey brick dwellings, Yarmouth road, $4,000; L. N. Yolles, alterations to store, 363-365 Queen street west, $3,500; Mrs. John Wheeler, one pair brick dwellings, Howard Park avenue, $5,000; W. F. & H. G. King, one pair brick dwellings, corner of Rusholme and College, $4,000; G. Bray & Son, two storey brick store and dwelling, corner Galley & Sorauuren, $3,000; A. Mackey, three attached two storey brick dwellings, Lappin avenue, $6,000; Jos. Pinder, two storey brick store and dwelling, on Queen street east, $3,500; L. M. Schwartz, three storey brick warehouse, on Edward, $11,000; Dale Furniture Company, four storey brick store building, Yonge street, $20,000; Standard Sanitary Manufacturing Company, and one two storey addition to foundry, corner Royce and Lansdowne avenue, $20,000; Worthy Pinkerton, one pair brick dwellings, Garnet, $4,000; H. Goldman, alterating dwelling into apartment, 71 Gloucester, $10,000; Wm. Graham, three storey brick warehouse, near King, on George, $12,000; Weismiller & MacKenzie Bros., fourteen pair semi-detached two tsorey brick dwellings, near Roncesvalles, on Fermanagh, $50,000; Reid Bros., one pair brick dwellings, Burnfield, $4,000; W. Barber, brick dwelling, near Galley, on Roncesvalles, $3,500; F. Martin, one pair brick dwellings, Leslie, $4,000; J. Cole, two pair brick dwellings, Margueretta, $8,000; Thos. Grinnell, two detached brick dwellings, Logan, $6,000; Alfred Knibbs, four detached brick dwellings, Galley, $8,000; T. T. Fleming & Company, one pair brick dwellings, Evelyn avenue, $4,000; F. Jackson, one pair brick dwellings, corner Carden and Sorauren, $4,600; Wm. Priest, four pair brick dwellings, Symington avenue, $16,000; C. C. Kurtz, one pair brick dwellings, Hogarth, $4,000; Gray & Gray, two and a half storey brick dwelling, near Roncesvalles, 71 Fermanagh avenue, $2,400; Tony Bartello, two storey brick dwelling, Strachan avenue, $2,500.

Vancouver, B.C.

Recent building permits include: Prudential Investment Company, $9,000 factory on Dufferin street; Mrs. A. Holtz, 1026 Thirteenth avenue, $3,000; Bentley & Wear, Eighth avenue, two houses, $4,600; C. Reid, Napier street, $3,000; D. Fraser, 1804 Second avenue, $2,500; Vernon Brothers, 1923 Fifth avenue, $3,000; A. L. Ramage, Clark drive, $2,500; J. Thomson, 722 Tenth avenue, $2,700; Mr. Williams, 186 Seventh avenue, $6,500; Max Krusknoft, Harris street, $2,400; W. J. Weinmoth, Eighth avenue, two houses, $4,000; H. M. Arnaud, 2566 York street, $5,800; J. McMillan, 343 Thirteenth avenue, $2,200.

Victoria, B.C.

Recent building permits include [illegible] Richards, house on Gladstone avenue, $2,500; J. Redmond, house on Moss street, $2,600. For both of these buildinges R. Hetherington is the architect. Other permits include Mrs. S. Baxter, dwelling on Superior street, $3,600; Dr. W. Russell, — Superior street, $3,600; R. Borthwick, for a dwelling on Johnson street, $2,500; C. H. [illegible] street, $2,500; Alexis Martin, for a garage [illegible] 000; J. O. Dunsford, for a dwelling on Dunedin street, $2,000.

Tenders addressed to Wm. M. Northcott, purchasing agent, City Hall, will be received until March [illegible] for supply of the [illegible]

Tenders and For Sale Department

To Civil Engineers

Applications addressed to W. J. DOUGLAS, Town Clerk, Eglington P.O., will be received up to and including FRIDAY FEBRUARY 25 next, at 8 o'clock p.m., for the position of Civil Engineer for the Town of North Toronto. Applicants must produce testimonials as to qualification and general fitness for the position and also state salary expected.

Duties are prescribed in a draft By-law which can be seen at any time during office hours at the office of the Clerk, Town Hall, Eglington. 8

Board of Education

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the board will be received untill

Friday Noon, February 25th, 1910

for masons and plasterers work required in the new eleven room

School Building, Logan Avenue

Plans and specifications may be seen and all information obtained at the offices of the board, City Hall, Each tender must be accompanied by the deposit mentioned in the said specifications and forms of tender. The lowest or any tender will not necessarily be accepted.

W. H. SMITH, Chairman of Commitee
W. C. Wilkinson, Secy-Treas.
8

Temiskaming and Northern Ontario Railway Commission

Tenders for Grading

Sealed tenders, addressed to the undersigned, and marked "Tenders for Grading" will be received up till 12 o'clock noon, on MONDAY, FEBRUARY 28TH for all and every kind of labor, tools, machinery, and other plant, services and material whatsoever necessary for the due execution and completion of, in a thorough and workmanlike manner, all the grubbing, grading, embankment protection, clearing and culverts necessary for the construction of a cut-off on the Main Line of the Temiskaming and Northern Ontario Railway, between M.P. 60 and M.P. 61.

Plans and specifications may be seen at the office of the Commission, 25 Toronto Street, Toronto, and the office of the Chief Engineer, North Bay.

Certified cheque on a chartered bank, payable to the order of the Secretary-Treasurer of the Commission for $500.00 must accompany each tender.

Tender must be made out on form supplied by the Commission.

Deposit cheque of unsuccessful tenderers will be returned.

Successful tenderer's deposit cheque to stand as security for immediate execution of construction contract, and then to be held, together with further security by bond satisfactory to the Commission, for the due performance of the contract.

Commission will not be bound to accept the lowest or any tender.

A. J. McGEE, Secretary-Treasurer,
25 Toronto Street, Toronto, Ont.

Toronto, February 8th, 1910.

Papers inserting this advertisement without authority will not be paid for same, 8

County of Elgin

Tenders For Bridges

Sealed tenders addressed to the undersigned will be received until noon SATURDAY MARCH 5TH, 1910 for the construction of Reinforced Concrete Abutements for a 133 foot span of a Roadway Bridge with Sidewalk, to be built over the Otter Creek in Pt. Burwell.

Also for a 60 foot Arch Bridge to be built over Kettle Creek in Lynhurst, adjoining St. Thomas. Plans and specifications may be seen at this office and forms of tender obtained.

The committee reserve the right to reject any or all tenders.

JAS. A. BELL
County Engineer

St. Thomas, February 21, 1910. 9

Tenders Wanted

Tenders will be received by the undersigned, until FRIDAY, MARCH 4TH, at 12 o'clock noon, for the erection and completion of a Sabbath School building in connection with the Welland Presbyterian Church, and also for certain modifications in the present church as per plans and specifications, which may be seen at W. H. Crowther's store, North Main street, Welland, on and after Thursday, February 10th, 1910. Tenders to be as follows: (1) Bulk tender for whole work as described in plans and specifications; (2) Separate tender for Sabbath School building alone.

No tender necessarily accepted.

ALEX. ASHER,
Secretary, Bd. of Managers.

8

To Contractors

Sealed bulk or separate tenders endorsed "Tender for addition to Ontario Parliament Buildings" addressed to the undersigned, will be received at this department until noon on

Tuesday, the first day of March, 1910

for the following works, viz.: Masonry, bricklayer, cut stone, carving, fireproofing, etc.; structural steel; steam heating; plumbing and gasfitting; iron armored conduit and electric wiring; vault doors; roofing, copper and sheet metal; carpenter work; ornamental iron and grille work; elevators; lathing and plastering; painting and glazing; marble and tile; metallic fire-proof doors, base and trim; hardware; iron-founders work; required in connection with the extension to the Ontario Government Buildings, Queen's Park. Plans and specifications may be seen at the office of Geo. W. Gouinlock, Architect, 1108 Temple Building, Toronto.

An accepted bank cheque payable to the order of the Honorable, the Minister of Public Works for five per cent of the amount of the tender and the bona-fide signatures and addresses of two sureties or the bond of a Guarantee Company approved by this Department prepared to give a bond for the due fulfillment of the contract must accompany each tender. Cheque will become forfeit to the Crown in the event of the successful tenderer refusing to carry out the work within ten days after the acceptance. The Department will not be bound to accept the lowest or any tender.

J. O. REAUME,
Minister of Public Works, Ontario

Department of Public Works, Ontario.
Toronto, February 4th, 1910.

(Newspapers publishing this advertisment without authori will not be paid for it.) 8

Factory For Sale, Rent or Exchange

1 storey, light, three-sides, 3,500 square feet floor space. Prominent corner on Queen Street, five minutes from Youge Street, Toronto. Address Box 920, CONTRACT RECORD, Toronto. 9

Tenders For

New Isolation Hospital

Toronto

Bulk tenders, or separate tenders for the several trades mentioned below in connection with the above building, will be received by registered post only, addressed to the undersigned, up to noon on

Tuesday 8th March, 1910

1. MASON WORK, Etc.
2. CARPENTER WORK.
3. GALVANIZED IRON AND ROOFING.
4. PLUMBING, Etc.
5. HEATING.
6. ELECTRIC WIRING.
7. PLASTERING.
8. PAINTING AND GLAZING.
9. TILING.
10. COMPOSITION FLOORS, Etc.

Plans and specifications may be seen and forms of tender and all information obtained at the office of the City Architect, Toronto.

Envelopes containing tenders must be plainly marked on the outside as to contents.

The usual conditions relating to tendering, as prescribed by City By-law, must be strictly complied with, or tender may not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY, (Mayor),
Chairman Board of Control.

City Hall, Toronto, February 4th, 1910. 8

Notes

Brodeur & Company, lumber, St. Hughes, Que., Mrs. Adeland Brodeur, registered.

A. S. Murray & Company, contractors, Niagara Falls, Ont., are stated to have assigned.

Monette, Cardinal & Company, builders' materials, Montreal, Que., it is stated, have disolsved.

E. B. Tedford & Company, lumber merchant, has sold out to Beaver Lumber Company, Limited.

Jutras & Freres, saw mill proprietors, St. Albert, Que. W. Jutras, A. Jutras and D. Jutras registered.

Peart Bros., hardware Company, Limited, Regina, Sask., have increased capital stock from $100,000 to $300,000.

The Expanded Metal & Fireproofing Company, Limited, of Toronto, have decided to open a Montreal office. Mr. J. E. McDougal will represent the firm in that city and has taken offices in the Builders' Exchange. It is understood that the company will make an extensive exhibit in the permanent exposition of the Exchange.

We Have Always in Stock:
at all our yards

Crushed Stone

and

Crushed Granite

For Fireproof, Sidewalk or Road Construction

Cement Building Stone Builders' Supplies

C.P.R., Grand Trunk, M.C.R. and T.H. & B. Railway Delivery.

ROGERS SUPPLY COMPANY

Head Office: 3 King Street East, Toronto
Phone Main 4155

YARDS:
Foot of Berkeley St.
Foot of Bathurst St.
Foot of Church St.
256 Lansdowne Ave.
C.P.R. Crossing North Toronto
G.T.R. Crossing Pape Ave.

Creosoted Wood Paving Blocks

cut from the log in our own mills out of live Douglas Fir and creosoted to specification as to Oil and Pressure. Capacity 1,000 yards per day.

Bridge, Structural and Mining Timbers

cut and sized to exact dimensions, and if so desired, framed in our yards before Creosoting.

Standard Creosoted Railroad Ties

Capacity after March 1st, next, 1,200 ties per day.

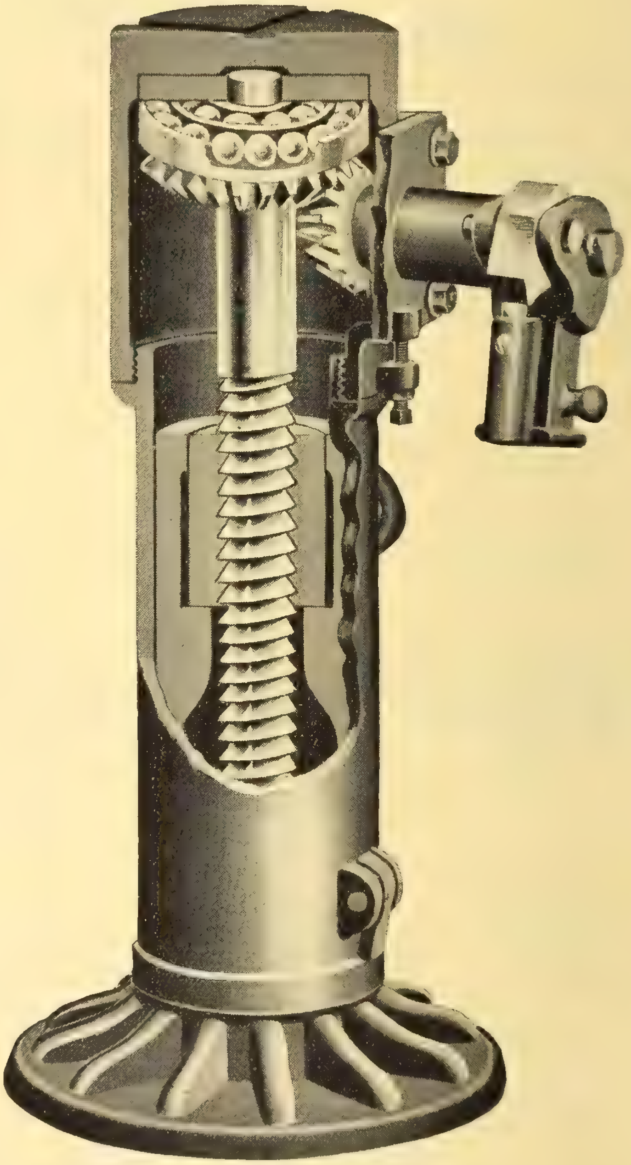
Dominion Carbolineum Works Limited

Vancouver, B. C.

NORTO

Th

A.O. NORTON BOSTON, MASS.



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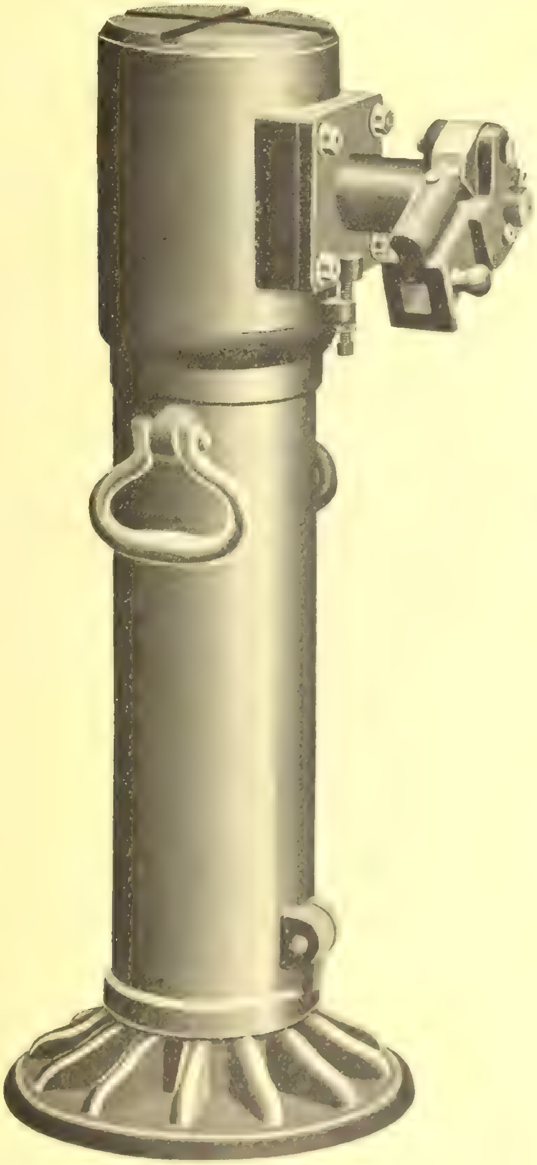


LIMITED

BRANCHES:
Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Vancouver - Metropolitan Bldg.

All Floors in this Building are Reinforced Throughout with

Beath's Triangle Mesh

Some Users:

Winch Building,
Vancouver, B.C.

Victoria Sheds,
Victoria, B.C.

Petrolea Bridge Co.,
Petrolea, Ont.

Filtration Plant,
Toronto, Ont.

Thomas C. Watkins
Hamilton, Ont.

Halifax P.O.,
Halifax, N.S.

Dominion Exp. Co.,
Ottawa, Ont.

Erindale Power Co.,
West Toronto.

Dominion Concrete
Co., Kemptville, Ont.

Some Users:

Joseph Vincent,
Union, Ont.

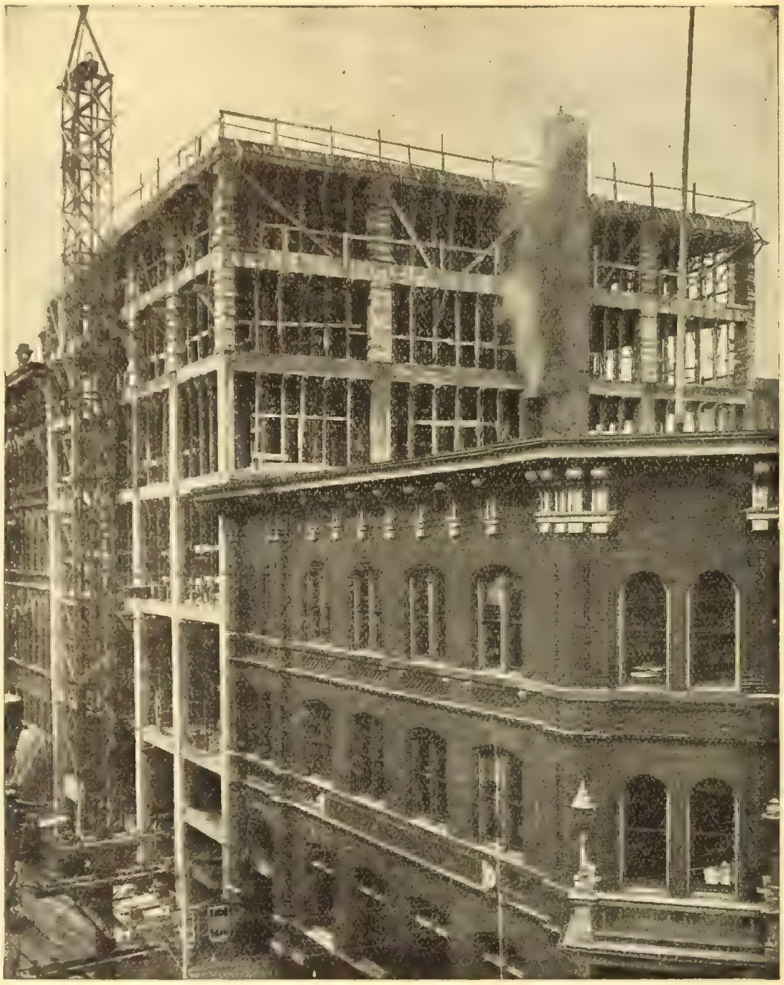
Robert Simpson Co.,
Ltd., Toronto.

Murray Shoe Co.,
London, Ont.

Septic Tanks,
St. Thomas, Ont.,

Septic Tanks,
Clinton, Ont.

Transformer Stations at Toronto, Dundas, Niagara Falls, St. Thomas, London, Woodstock, Paris, Preston, St. Marys, Stratford, Guelph and Berlin.



Cut shows Reinforced Concrete Building under construction for the Thomas C. Watkins Departmental Store, Hamilton.

This System of Concrete Reinforcement is rapidly becoming known as "The Most Satisfactory and Economical System" on the market. One million square feet of Triangle Mesh sold in Canada during 1909, its first year, attest its popularity among discriminating Architects, Engineers and Contractors. If you are contemplating or have under construction a modern fireproof building it will pay you to investigate "The Beath System."

WE INVITE YOUR ENQUIRY

W. D. Beath & Son, Limited

Toronto - Canada

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
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SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto February 23, 1910 No. 8

Need of Trade Schools

At the recent convention of the Canadian National Association of Builders, possibly none of the many important subjects discussed were of more vital interest to the building industry than that of technical education. The need of trade schools which shall be really and truly schools for turning out competent mechanics, and not producers of foremen and supervisors, is again being experienced. With the approaching revival of building activities, contractors and builders apprehend the usual scarcity of sufficient workmen to carry on the work as rapidly as desired. They realize that competent workmen are becoming scarcer and scarcer in many of the trades, due to the decline of the apprentice system, and the lack of younger men learning the trades. Young artisans should be trained to do as acceptable work as was demanded under the old standards, and better. Their training was not the last that could be attained and progress is demanded in everything. The development of newer forms of construction makes it essential that all the merits of the older forms of building shall be utilized as a matter of meeting competition.

The element which is inclined to resent the training of new men to the trades, may not realize it, but the attitude is one which will surely divert construction to the other forms, for building, like everything else, will naturally work along the lines of least resistance. If the scarcity of skilled men in one craft makes it impossible to erect a building as speedily as it might be done, the natural result will be that many buildings will be changed to such forms of construction as can be handled more quickly [illegible] to that line. The older element is dying off, and if younger men are not trained to succeed them, there will be the inevitable result of the trade becoming nearly obsolete

The Cash Deposit Clause

In a recent communication to the city of Winnipeg, a leading supply company of Baltimore, Md., revived an interesting subject in objecting to the payment of a 5 per cent. cash deposit. Seeing that in the case under discussion the amount involved by the condition totals about $7,000, the company might appear to have some cause for complaint. They state that it is their practice to give a "bid bond" in place of a cash deposit.

It seems to us, however, that although the cash deposit clause condition may at times seem somewhat stringent when its equivalent in dollars is worked out, it is essential to the interests of a municipality and to equitable and reliable tendering. If there were no restrictions of the kind stated there would be all kinds of irresponsible firms getting into the game and spoiling it for those who are perfectly willing to risk a certified cheque of $7,000 or more on the reliability of their bid, once prepared. The contract with which the Baltimore company was concerned was for the supply of 2,500 to 3,500 tons of asphalt. On such an order as this it would seem particularly desirable to enforce the letter of the by-law.

Unionism Has Food for Reflection

The Plumbers' Union have lost once more in their final effort to set aside the judgments of the Canadian courts in the now famous strike case, in which the master plumbers of Winnipeg attacked the right of the striking employees to "picket" their places of business during the progress of the strike of two years ago. As a last resort, the unions appealed to the Privy Council on certain points. The master plumbers secured the services of a leading firm of London, Eng., barristers to present their arguments. No case in many years has excited so much interest. The damages, about $4,000, awarded to the master plumbers against the unions, will stand, according to the decision of the Privy Council. The finale is a heavy blow to unions at large, and especially in so far as their rights during a strike are concerned

At a meeting held recently in the rooms of the Engineers' Club, Toronto, the organization of the new club for technically trained men, was completed. Among the [illegible] A. W. Campbell, C. M. Canniff, J. G. Sing, Willis Chipman, Cecil B. Smith, J. G. Kerry, R. G. Black, Chas. W. Dill, W. E. Douglas, T. S. Scott, Geo. W. Gouinlock, John A. Pearson and Acton Bond.

[illegible] for the rest of his life

Extension of "Right House" Hamilton, Ont.

Features of the Work which make it of Unique Interest —Detailed Description of Up-to-date Methods of Construction Employed

Specially Contributed by Edwin H. Beck, Inspecting Engineer, Canadian Inspection Company, Limited

The reinforced concrete addition which is now being erected for the Thomas C. Watkins Company's store on King and Hughson streets, Hamilton, Ont., contains several features of interest. Among other interesting points, it embodies the connecting up of a reinforced concrete structure with an ordinary brick building, the floors of which are of wood beams supported by iron columns.

21st September '09—Concreting in Alley at Rear, Showing Method of Reinforcement: Triangular Wire Mesh with Steel Rods.

The old building has 61 feet frontage on King street and 136 feet on Hughson street, and is four storeys high. The new addition has a frontage of 81 feet on Hughson street, and runs back 80 feet to an alley in the rear. It will contain six storeys and basement, with a Mezzanine floor between 1st and 2nd floors, running across the north end of building. It is proposed to add another two storeys to the old building in the near future, thus making the whole structure six storeys high.

After a part of the excavation had been removed, the south wall of the "Times" building, which is on the north of the Watkins property, had to be underpinned, to ensure the safety of that building during the excavation for the foundations of the concrete piers. The ground at this point was found to be of the following nature: Hard packed sand and earth down to 14 feet below Hughson street level; then a 12-inch layer of hardpan; beneath was found a soft fine sand with water standing at a level of about 12 inches under bottom of hardpan. A test made on this sandy bottom gave 3-16-inch penetration with a load of $3\frac{1}{2}$ tons per square foot, the test being made with a 6-inch x 6-inch post, with platform on which was placed the load.

28th September, '09—Excavation of Old Alley in Progress.

This test being considered satisfactory, the foundations for concrete piers along the "Times" building were proceded with. In order to take up all possible space, these piers were built close up to the "Times" wall, necessitating a cantilever footing, or, more correctly, an inverted beam, suporting an outside pier at the one end, and an inside column at the other. These five footings were designed as before mentioned, as inverted beams, being from 7 to 9 feet wide, 21 feet long, and 5 feet deep, with reinforcing bars of $1\frac{1}{2}$-inch square steel embedded near the top, and shear bars attached to every other bar, as shown in fig. 1. The footings for the columns and piers were as shown in fig. 2, with steel bars 5 feet long embedded 2 feet 6 inches in the top cap, forming dowels. The allowable load on the ground was $2\frac{1}{2}$ tons per square foot.

The shipping alley, which previously ran from James street through to Hughson street, along the north wall of the old building, had to be deviated, the property being bought and pulled down in order to turn the alley out to King William street. Before the portion of the alley along the north side of the old building could be excavated, the alley opening on King William street had to be completed for traffic, and as the boiler room of the new building is situated in the area beneath the portion of the alley directly in the rear of the new building, this necessitated the erection of first tier of columns, and a 6-inch slab of concrete, supported by reinforced concrete beams, forming floor of alley at this point, which is finished off with Massillon, Ohio, vitrified paving brick, laid in a bed of pitch and grouted in with cement. This portion of the work was completed and traffic turned into King William street on October 5th, 1909. Meanwhile, the rest of footings, except those for columns along line of north wall of old building were put in. The

15th October, '09—Preparing 2nd Floor Forms for Concreting.

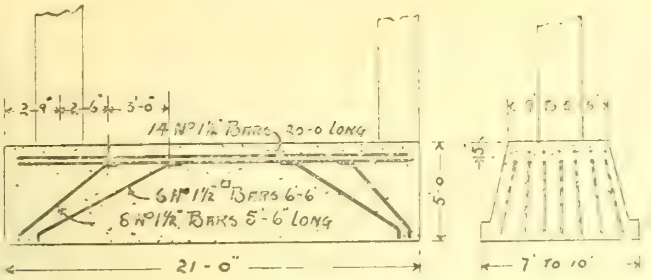


Fig. 1—Shear Rods firmly attached to Horizontals.

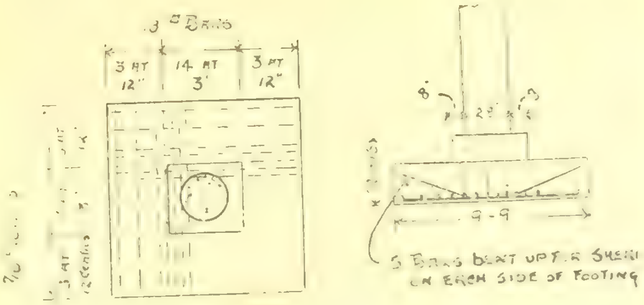
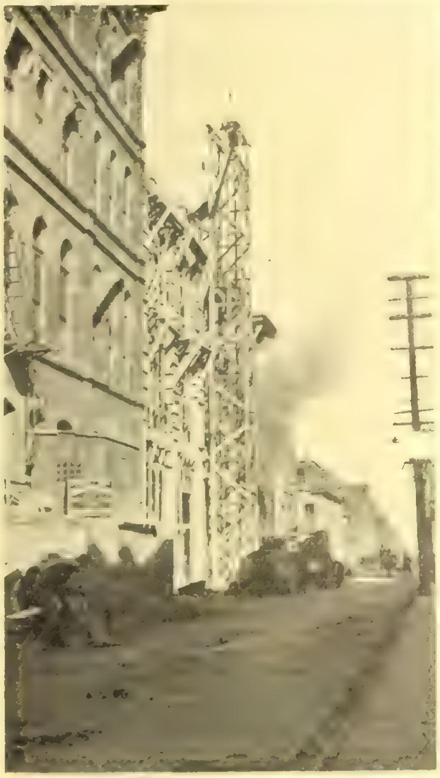
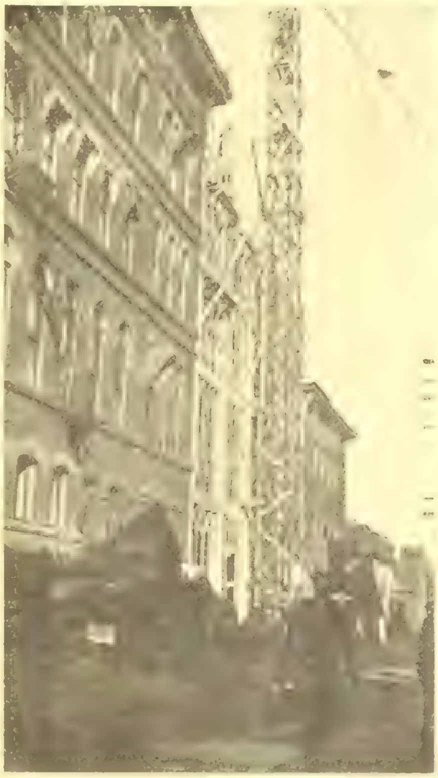


Fig. 2.

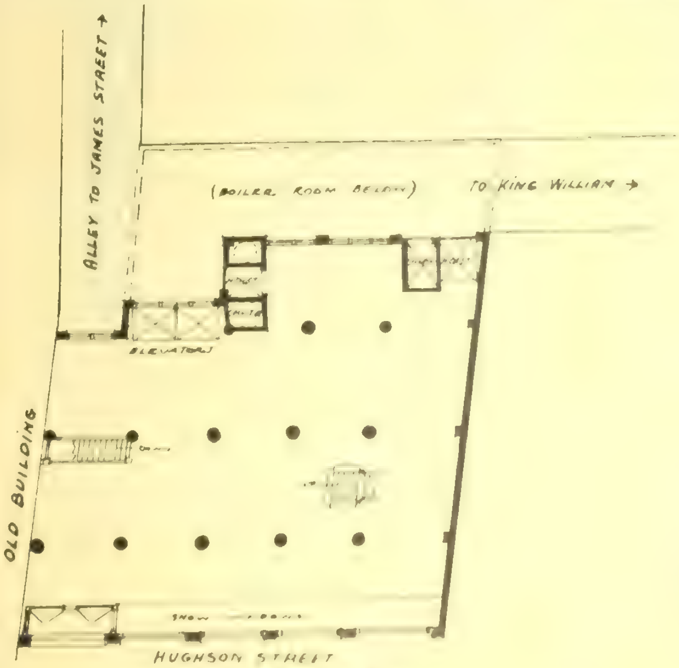


5th Nov., '09 Fourth Floor Completed.

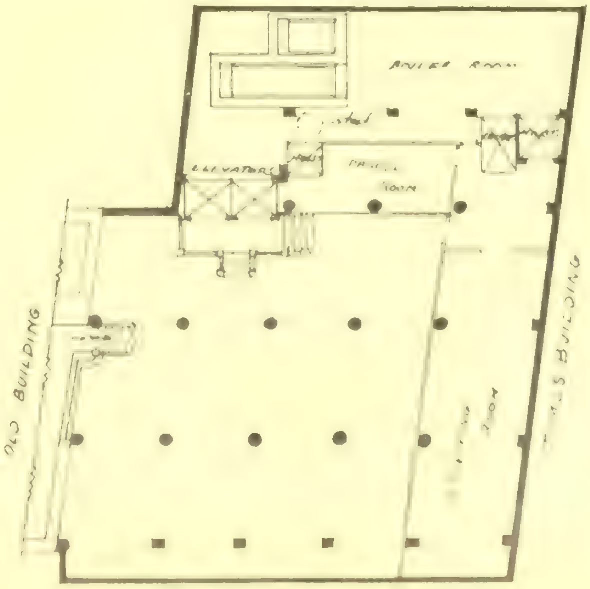


15th Nov., '09 Erecting Forms for Sixth Floor.

Veneering front of Columns on Hughson St. (This was started from the second floor level, the brick being carried in angles bolted into concrete piers at each floor).



Ground Floor Plan.



Basement Plan.

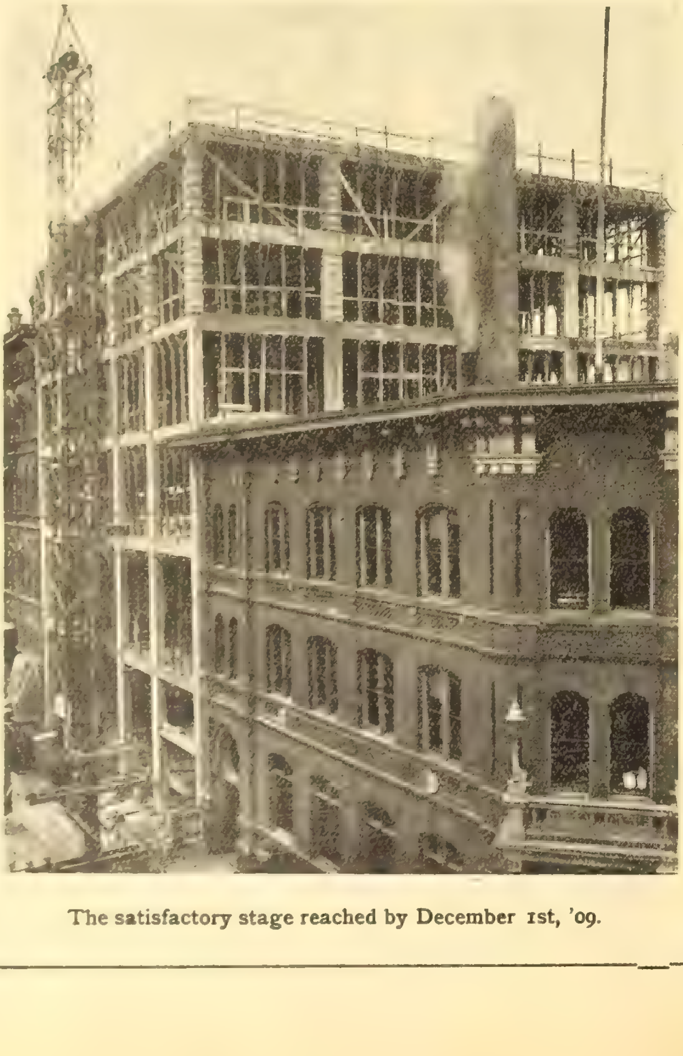
View from Rear, Showing Form Supports in Position.

15th October, '09—Showing Steel Reinforcement on Mezzanine Floor.

excavation for area beneath sidewalk on Hughson street and the old alley excavation was then removed, and rests of footings put in. Those for columns along old building wall going under the foundation of the wall, necessitated more underpinning. This was done by using two jacks to each column foundation, having a steel plate at top and bottom, and then running in concrete as soon as excavation was removed, the jacks being left embedded in the concrete.

As can be seen by an examination of the accompanying "progress chart," and the photos published herewith, record progress was made after these difficulties had been overcome, the average time taken being six days from start to finish of each floor. For this, due credit must be given to the officials of the Bishop Construction Company, the contractors for the concrete work, and their superintendent, Mr. H. Hovis.

All outside piers are built square, reinforced with square steel bars and veneered on the Hughson street front with brick, which is tied into the piers with iron ties, one end of which are embedded in the concrete during construction. The beams form the window lintels and will be finished off to match the sills, which were made of Roman stone. The curtain walls are of brick, one brick thick. At the rear, the concrete piers are left exposed, as are also the north and south walls, which rise above the other buildings, the brick curtain walls bonding into a 4½-inch groove left in piers for that purpose. All inside walls and partitions are of best American tile. The inside finish to columns and concrete will



The satisfactory stage reached by December 1st, '09.

Setting in Place the Reinforcement for Circular Columns.

be a putty coat and will be painted and decorated to correspond with the old building. The roof is designed as a floor at 100 pounds per square foot, the slopes being formed in wood above so that another storey can be added in the future, if required. The passenger elevators will take up the roof, which will be used as a roof garden. The pent house over passenger elevators will therefore have to be built up 24 feet above the roof. As far as Hamilton is concerned, this will be an unique feature.

Owing to the desire of the owner to keep the diameter of concrete columns as small as possible in order to conform somewhat with those in the old building, a greater amount of reinforcement had to be used. This was obtained by using vertical square bars with ½-inch diameter bar hooping, as shown in accompanying photo. The columns range from 28 inches diameter in the basement, to 12-inch diameter on the top floor. The floor slab is made 4½-inch thick, reinforced with triangular wire mesh, and is supported by 8-inch x 18-inch beams reinforced with Kahn cup bars, running into 14-inch x 24-inch girders reinforced with Kahn trussed and square bars. Concrete throughout is 1 : 2 : 4 mixture. The floors are finished with hardwood, laid on wood strips filled in with cinder concrete. All conduits for electric wiring were embedded in the concrete during construction, as also were small castings for hanging the sprinkler system. These items do away with a considerable amount of drilling in the floors after erection, which is detrimental to reinforced concrete work. Window frames and sashes in Hughson front are of wood, and those in rear and at sides of metal, with wired glass.

The new concrete columns in the south side are about six inches from the brick wall of the old building, the wall of which has to be removed. The old floor beams are replaced at this point by steel beams, which will be supported in brackets already provided for on concrete columns. In this way the two buildings will be opened up into one, having a total frontage on Hughson street of 217 feet.

The vacuum system of heating will be employed throughout. A fire protection water tower of 25,000 gallons capacity will be erected on the northwest corner of the new addition.

Single floor area of new addition	feet	6,000
Single floor area of old building	feet	8,000
Total one floor	feet	14,000
Total floor area of building	feet	82,000

Kinnear automatic fireproof curtains will be installed between the two buildings, thus ensuring safety to the new building in case of fire in the old, or vice versa.

The following is a list of contractors employed in the construction: Reinforced concrete, brickwork and artificial stone, Bishop Construction Company, 19 Wellington street, Toronto; underpinning and boiler foundations, George E. Mills, Hamilton; wood frames and sashes, Brisset, Hamilton; excavation, C. Kennedy, Hamilton; plumbing, Drake & Avery, John street, Hamilton; heating, Adam Clarke, Hamilton; electrical work, Culley & Breary, Hamilton; painting, Wellington, Hamilton; elevators, Otis-Fensom Elevator Company, Toronto and Hamilton; metal window frames, Metal Shingle & Siding Company, Preston, Ont.; boilers, Polson Iron Works Company, Toronto; water tower, Gould, Shapley & Muir, Brantford, Ont.; slab reinforcement, W. D. Beath & Son, Limited, Toronto; beam and column reinforcement, Trussed Concrete Steel Company, Limited, Toronto; fireproof doors, A. B. Ormsby, Limited, Toronto.

The architects were Messrs. Stewart & Witton, of Hamilton. The Canadian Inspection Company were entrusted with the testing of all materials used, and with inspection throughout. The approximate cost of the new building is $75,000.

CEMENT TEST RECORD—LEHIGH (BELLEVILLE) BRAND.

Tested by Canadian Inspection Co. to Standard Specification Adopted by Canadian Society of Civil Engineers.

The following is average of 3 briquettes broken for each test:

TEST.	DURATION.	REQUIRED OR ALLOWED.	OBTAINED MINIMUM.	OBTAINED MAXIMUM.	AVERAGE.
Neat Cement	24 hours	150-200	250	358	309
	7 days	450-550	474	632	543
	28 days	550-650	559	656	614
3 Sand 1 Cement	7 days	150-200	150	221	179
	28 days	200-300	250	319	280
Loss on Sieve	50 mesh		0	0.2	0.07
	100 mesh	[illegible]	2.9	[illegible]	3.73
	200 mesh	[illegible]	19.0	21.2	20.24
Initial Set		Not less than 30 min.	1 hr. 33 min.	4 hr. 6 min.	3 hr. 2 min.
Final Set		1 to 10 hrs.	4 hr. 35 min.	6 hours	5 hr. 16 min.
Boiling Test		O. K. in every case.			

In the 7 day test of 3 sand 1 cement, 4 briquettes failed under the 150 lbs., but in the 28 day test all briquettes were [illegible] requirements.

PROGRESS CHART—1909.

	1st.	Mezzanine.	2nd.	3rd.	4th.	5th.	6th.	Roof.
Wood Forms								
Started	8 Sept.	5 Oct.	7 Oct.	20 Oct.	1 Nov.	8 Nov.	13 Nov.	23 Nov.
Finished	11 Oct.	8 Oct.	19 Oct.	28 Oct.	5 Nov.	11 Nov.	19 Nov	27 Nov.
Days taken	28	4	11	8	4½	3½	5	5
No. of Carpenters	7	23	[illegible]	31	37	40	36	30
Concrete								
Started	18 Sept.	14 Oct.	16 Oct.	27 Oct.	3 Nov.	11 Nov.	18 Nov	27 Nov.
Finished	12 Oct.	15 Oct.	21 Oct.	[illegible]	5 Nov.	12 Nov.	20 Nov	30 Nov.
Days taken	21	2	[illegible]	3	2 1-5	2	[illegible]	[illegible]
Cubic yards	[illegible]	48	[illegible]	183	[illegible]	160	158	150
Hours concreting			27	[illegible]	[illegible]	[illegible]	20	[illegible]
Average yards per hour		4 about	[illegible]	[illegible]	7.1	7.4	[illegible]	[illegible]

Average concrete laid from 2nd floor to roof—7.3 yards cubic per hour. Floor area, 6,000 square feet.

1st floor height 12 ft.
2nd " " 19 ft. 6 in. Completed in 5 working days.
3rd " " 17 ft. 6 in. " [illegible] "
4th " " 15 ft. 3 in. " 6 "
5th " " 14 ft. 0 in. " 6 "
6th " " [illegible] " [illegible] "
Roof " " 12 ft. 0 in. " 8 "

Methods in the Demolition of Old Buildings

An Important Factor in Modern Building Construction, Requiring Care and Skill Outline of Proper Procedure to be followed

Among the many recent innovations which have gradually, by a sort of evolution, crept into, and become an important part in building operations is that of demolishing old or previously erected buildings to make room for and provide sites for more modern and up-to-date structures. In the large cities it has become necessary to tear down the buildings no longer tenantable or adaptable for office or business purposes to make room for those more profitable. Add to this the moving away of homes and residences, to quieter localities far from the hurly burly of business, and there will be found a sufficient reason for active "demolition."

Needless to say, the process of demolishing a building or number of buildings is particular, and demands the greatest care, combined with an abstract knowledge of building construction; so that the superintendent, director or foreman, at least, must be experienced in the work to guard against possible collapses or the endangering of the lives or limbs of the men working under him. So many lives, indeed, have been lost, and so many accidents occurred already, as to cause the governing authorities in cities to enact stringent laws and rules regulating "demolition." Let us quote one of them:

"When plans and detailed statements are filed in the Department of Buildings for the erection of a new building, if an existing building or part of an existing building is to be demolished, such fact shall be stated in the statement so filed.

"In demolishing any building, storey after storey shall be completely removed. No material shall be placed upon the floor of any such building in the course of demolishing, but the bricks, timbers and other structural parts of each storey shall be lowered to the ground immediately upon displacement. The owner, architect, builder or contractor for any building, structure, premises, wall, platform, staging or flooring to be demolished shall give not less than 24 hours' notice to the Department of Buildings of such intended demolition. Buildings condemned as unsafe, untenantable, or dangerous, may be removed without demolition permits. The condemnation documents being equivalent and mandatory."

Demolition permits are then granted and the work may proceed, of course under the surveillance of the inspector of buildings in charge of the district in which the building is located.

Now as to the actual procedure of the work. As the building was commenced at the bottom, so it must be torn down by commencing at the roof, but it is usual to first remove all projecting ironwork, such as fire escapes, cornices, leaders, balconies or any detail which would cause all or any walls to overturn when torn down to beam level. Then chutes are constructed of wood, outside the walls, for the purpose of expeditiously and cleanly transferring all old plastering and debris to the waiting carts and wagons on the street below. Next the tin or roof covering is carefully cut in sections, rolled, tied and lowered with block and tackle to the street; next the cornices and sashes and wondow frames are removed.

At this point I might state that most "demolishers" combine this occupation with the business of selling second-hand building materials, so that each and every detail is removed as far as possible intact and uninjured, so as to have a marketable value to be used again.

Brick chimneys are taken down before the roof boards are taken off, also all parapet walls, copings and flashings and the walls, too, to the level of the bottom edge of the roof beams. This being done, the stairs are taken out, if valuable, and replaced by rough ladders. Then the roof boards are levered off with crow-bars, bundled and lowered; then the bridging knocked out, and finally the roof beams themselves, thus giving a safe opportunity to cut down the top storey brick walls, which must not be thrown or barred down in heavy sections, but knocked apart with light hammers, course by course of bricks, as constructed. It is usual to first take out all fixtures, such as trimmings, basins, plumbing, etc., before demolishing the brick and timber-shell, so as to prevent injury, but this depends on their condition and value From the top storey down all are demolished, but the walls must be closely watched, and if any show evidence of bracks, bulges or unsafe conditions they must be either shored or tied back with cables to guard against fall. No materials should ever be thrown into the street, and a platform or roof should be erected over the sidewalk to guard pedestrians from injury by possible falling materials. To keep down dust and make the debris shovable, a hose should be kept spraying the debris as it is piled, and not too much weight should be piled in one place, lest a floor be strained or overloaded. Collapses have occurred by neglect of this precaution. Heavy girders, steel beams, and columns must be lowered with a derrick, windlass and tackles to save their condition and maintain safety. It is a serious error to drop a heavy weight on the floor of an old building, as the impact is liable to cause disaster.

It is better to pile stuff close to the walls of a building and not in the middle of the beams. Partitions, especially those running fore and aft, should be let remain in position until the beams above are ready for removal, to prevent the latter sagging. All workmen should be careful not to drop tools or materials on those at work underneath. When demolishing old wrought iron or cast iron structures all details should be suspended from the derrick before cutting out rivets or removing bolts; besides, they can be at once lowered, thus avoiding delay. As the constituent details and materials of buildings are so different and multifarious, I will close this article by repeating the old warning that "Eternal vigilance is the price of safety," especially in this hazardous work of "demolition," which has now become a permanent factor in building operations and demands as much supervision as construction itself.—National Builder.

No modern building is now complete without a heating system that requires the storage of fuel in the basement, and it becomes necessary to provide an efficient opening for getting this fuel into the basement. The "Majestic" and "Model" coal and wood chutes, manufactured by the Down Draft Furnace Company, Limited, Galt, Ont., should be specified by every architect and used by every house builder. They have a neat and finished appearance and embody the most up-to-date features of construction.

Placing Concrete Under Water

There is undoubtedly a strong prejudice in the engineering profession against laying concrete under water, says the "Engineering News." Millions of dollars are spent every year on cofferdams and caissons, in order to lay foundation concrete in the dry. Notwithstanding this, it is entirely possible to lay concrete under water which will be as sound and solid as the best concrete laid in the open air. As our readers will recall who have followed the construction of the Detroit tunnel, a large amount of concrete has been deposited around the submerged steel tubes. We recently examined a core from this concrete, which had been taken to determine its quality. The core was as sound and solid as a natural conglomerate rock. Tests of samples of this concrete have shown a strength as high as or higher than the best specimens of concrete laid in the open air. This concrete is deposited through a tremie, or long tube with its upper end in the open air a considerable distance above the water surface, and its lower end at the point where the concrete is to be laid. Concrete put in place by such methods is forced in under a pressure far greater than is possible with any hand ramming ever used. There is no space for voids and no opportunity for the entrance of air. Furthermore, the concrete is never dried out in the process of hardening, and has always available all the water that it needs for its final set. These reasons are all of importance in explaining the high quality of concrete laid in this way.

Of course, "one swallow does not make a summer," and to offset this case, plenty of examples can be quoted where concrete has been laid under water with very disappointing results. But it all depends on how the work is done and the conditions under which it is carried on. Cases like that at Detroit deserve the attention of engineers as showing that there are alternatives to the construction of expensive cofferdams and pneumatic caissons. It is entirely possible that by more intelligent work in laying concrete under water, the cost of many pieces of submarine foundation work could be greatly reduced.

Paints that will Resist Fire

The "Painter's Magazine," speaking of paints for interior woodwork, says that experience has shown that paints consisting mainly of linseed oil, driers, and pigments, are not fire-resisting, and certainly not fireproof. Repeated coatings of silicate of soda, however, will add to their safety. Three coats of silicate of soda, 33 degrees Beaume, should be applied to the wood, and before the last coat has set hard, thin lime wash should be added, which will unite the silicate of soda, forming silicate of lime, which is an insoluble substance.

Another fire-resisting water paint consists of the following ingredients: Eighty pounds powdered silex, 40 pounds bolted china clay, and 20 pounds air-slaked lime, mixed with 60 pounds liquid silicate of soda, 33 degrees Beaume, and then thinned to painting consistency. It may be colored with any earth color, such as ochre, umber, sienna, or red oxide, but not with chemical colors. Two coats of this paint are necessary in the application. If the paint is to be pure white, add, in place of any color, sufficient dry zinc white, using additional silicate of soda in the first mixing.

A new department has been created in the Provincial Government of Alberta. Hon. [illegible] is the first Minister of Municipalities. He will have charge of all roads, bridges and local improvement districts.

The Maintenance of Dirt Roads

In an address before the Cornell Society of Civil Engineers, Mr. Charles H. Hoyt, superintendent of road construction, United States Office of Public Roads, discussed dirt roads as follows:

A word about the long abused dirt road, and by dirt road let me explain that I mean the ordinary country roads that have been built and worked by town officials for the past centuries through any kind of material that happened to be encountered from sods, gravel, sand, boulders, clay, soil or mud.

The dirt road is a good road so long as it is dry, smooth and hard—three conditions that we do not get all at once for very long periods of time. It is beyond the province of man to say when it shall rain or when it shall not rain; therefore, to a certain degree it is not possible for us to keep an earth road dry.

It is possible for us, however, to put our earth roads in such locations and to build them of such cross-section, and to build ditches and culverts of such design as will keep the water away from the road as much as possible.

The great trouble with miles and miles of earth roads throughout this country is the stupidity of their location and their care. You just look at a poor stretch of earth road and you will often find that it is lower than the surrounding land on either side. That is, the road is a natural ditch, built by man, for acres and acres of surrounding land. Water that falls in the road cannot get out except by evaporation or soaking into the ground, and just as much lower as the road is than the adjoining land, it is just so much more wet. The water from the adjoining land runs or sinks into the road and stays there until it dries out.

Do you wonder that the road is muddy, spongy and soft, and that an empty waggon is about all that a team can draw over a road that is in this condition for various lengths of time throughout the year? Another condition is when the road dries hard, the ruts are deep and the road is rough. This rough condition often occurs in the fall of the year when the road freezes after a muddy spell.

Suppose these ruts had been levelled off with a split-log drag before the road baked or froze hard. Then the road would have been smooth and hard and in good condition for a time. The split-log drag is a very simple affair; costs about $2 to build, is economical to use, and every farmer or teamster living along a country road, who is interested in having the road past his place kept in good condition and is also interested to keep highway taxes down, should have a split-log drag.

Suppose that every such farmer or teamster had one of these drags and would drag the road in front of his own property after each rain or when ruts had formed. It might take him from one-half hour to an hour occasionally throughout the season. After the road has once been built in proper shape it is surprising how good the road may be kept by using split log drags as suggested.

Now, the practical lesson of all this is study the drainage of your road; keep the water away from it by ditches and culverts, and don't look just in the road itself; [illegible] surrounding land and keep the water away from the road before it gets into the road. [illegible] ditches for hundreds of feet away from the road if necessary.

[illegible] up higher than the adjoining ground. Keep the centre of the road 6 to 8 inches higher than the sides, and from 2 to 3 feet higher than the side ditches so that the water will run from the road to the side ditches and then along the road in the side ditches and not [illegible] the road. Give the dirt road a chance with intelligent care and it will surprise you.

It is an easy matter to talk about our country roads, and no one appreciates more keenly than I do, the difficulties and the responsibilities that our town highway officials have been struggling with during the past years. We must recognize conditions as they exist and meet them in a practical way, otherwise our talking will do no good. The average amount appropriated for repairing country roads in the United States is about $37 per mile. This is not enough, especially if it is worked out by day labor. There may be places where less than $37 per mile will do very well, but there are a great many places where $37 per mile is not sufficient. It is useless for us to talk about better roads unless necessary funds and skilled supervision are provided.

Points in Favor of Concrete Culverts

Economical in Cost, Profitable to the Contractor, Inexpensive in Maintenance — Methods Employed and Interesting Costs

Concrete culverts are economical from the standpoint of the taxpayer, desirable on the part of the highway commissioner and profitable for the contractor, says a writer in "Concrete." The citizen gets a good culvert for little money, the roadmaster is given a material that is easily handled and, once made into a culvert, requires no repairs, and the contractor is allowed to take a legitimate profit by using local labor and local materials.

We have an interesting account of the building of a 32-foot culvert in Nebraska. The superintendent says:

"We started with the following material on hand: 8 cubic yards crushed stone, 6 cubic yards sand, 44 sacks of Portland cement and two patented culvert forms, 4-foot x 10-foot.

"We tore part of the old wood bridge away, cleared a base for the foundation, which was 4 inches thick, made of concrete mixed 1 : 2 : 3, cement, sand and stone. One of the culvert forms was put in place and the reinforcing rods and wire were bent over it. The form was then covered with a layer of concrete 5½ inches thick, with the reinforcement embedded in the concrete. Wood forms for the wing walls, and the retaining walls beyond them, were placed and the concrete tamped in them. On the second day we withdrew the form from the first part of the culvert tube and concreted the second portion, continuing the operation until the full length of 32 feet had been constructed. The other wing walls and retaining walls were then built.

"The reinforcement consisted of ⅝-inch steel rods, cut in 6-foot lengths, spaced 18 inches apart, bent and arched over the forms, with hog wire fencing placed over the top. After the concrete had been placed and all forms removed, 10 inches of earth were placed over the culvert and 48 hours after the structure was in commission.

"In this culvert we placed 13 cubic yards of concrete, using 44 sacks of cement and 120 square feet of hog wire fencing. The forms for the retaining walls and wing walls were built of boards from the old wood culvert. The labor cost was $33.75, and $8.10 was spent for reinforcing."

This account illustrates one of the chief arguments for concrete culverts. Ordinarily sand and gravel can be taken from the bed or banks of the stream. Cylindrical forms and Portland cement are the only materials that must be carried to the job. There are no long waits for freight shipments of steel girders or corrugated iron culvert tubes. Local labor, under intelligent supervision, will make a good job. What money is spent is spent right in the county. The concrete culvert will stand for decades without repair. These are some of the points to be urged by contractors bidding on this class of work. The fact that the road is not blocked for more than a very few days will appeal to the farmers.

Cost figures in culvert work are interesting. An ordinary 2-foot wood culvert requires 800 feet, board measure, at $20 per M.; labor costs at least $4; total, $20. This culvert must be rebuilt in five years.

A concrete culvert of the same size will cost about $30 and will last 60 years. Result: In 60 years wood culverts will have cost $240, while concrete structures will have cost but $30.

The cost of concrete culverts varies in different localities, due to fluctuations in cement prices, proximity of sand and gravel, etc. The following table will be found useful in figuring on culvert jobs, the cost of which can easily be learned, given the local prices of materials:

Material for Ten Foot Culvert Without Wings

Culvert. Size of	Cu. ft. of Concrete.	Cu. ft. of Stn. or Gvl.	Cu. ft. of Sand.	Sacks of Cement.	Reinforcing Wire.	Reinforcing ½ or ⅝ rods.
1 ft.	14	12½	6¼	2½	18 sq. ft.	None
1½ ft.	18½	16½	8¼	3½	22 sq. ft.	None
2 ft.	24½	22	11	4¾	30 sq. ft.	None
3 ft.	53	47½	23¾	9½	45 sq. ft.	5 pcs 4½ ft.
4 ft.	70	63	31½	13	60 sq. ft.	5 pcs 6 ft.
5 ft.	118	106	53	24	75 sq. ft.	7 pcs 8 ft.

Concrete in 1-foot, 1½-foot and 2-foot..... 4 in. thick.
Concrete in 3-foot and 4-foot .... 6 in. thick.
Concrete in 5-foot .... 8 in. thick.

Toronto Engineers' Annual Banquet

The ninth annual banquet of the Engineers' Club of Toronto was held on Thursday, Feb. 17th.

The chair was occupied by Mr. A. B. Barry, president for 1909, the present president, Mr. C. M. Canniff, acting as vice-chairman. "The Profession," proposed by Mr. Canniff. was replied to by Dr. John Galbraith, Dean of the Faculty of Applied Science in the University of Toronto. "Sister Societies," proposed by Mr. A. F. Macallum, City Engineer of Hamilton, was responded to by Mr. A. F. Wickson, president of the Ontario Association of Architects; Mr. H. W. Selby, vice-president of the Ontario Land Surveyors; Mr. R. G. Black, and Mr. J. C. Murton, of the Engineering Society of the University of Toronto. Messrs. C. M. Canniff, R. A. L. Gray, G. W. Heaton and others contributed to the programme of songs and recitations.

Mr. Angus Smith, city engineer of Regina, has resigned to accept a similar position at Moose Jaw, Sask., made vacant by the resignation of Mr. Darlington Whitmore. Sixty-one applications were received by the Moose Jaw council.

Paving Work along Street Railway Tracks

Features of Recent Practice Adopted at Indianapolis—Use of Asphaltum Filler—Need for Cheap Cementing Material

By Thos. MacMath

The pavement in street railway tracks is subject to additional destructive conditions besides those encountered on ordinary streets. The concentrated wheel loads of the modern cars distort and deflect the rail. This breaks any contact the pavement may have with the rail and provides entrance for water into the body of the paving. Heavy, stiff rail with good fastenings and solid ballast reduce deterioration of the paving but do not prevent the vibration of the rail. This cannot be eliminated.

During the past year in Indianapolis several features in track paving have been studied. The reconstruction of track in the business centre of the city presented opportunity for improving the track construction. Two blocks of track on Pennsylvania street between Washington and Ohio streets, were rebuilt, using every care to make the work as permanent as possible.

The 9-inch girder tram rail, 90 pounds to the yard, was laid on 6x8-inch by 8-foot white oak ties, spaced 2 feet. The subgrade was excavated to a depth of 10 inches below the bottom of the ties and rolled till compact. The track was raised on blocking to the proper grade and line and the excavation filled with Portland cement concrete to within 5 inches of the top of the rail and allowed to set for 10 days. Brick surface was applied on a sand cushion. At the street intersections where traffic could not be kept off, the brick was filled with asphaltum filler. The balance of the paving was grouted with Portland cement, every effort being made to fill the joints completely with grout.

The new features of this track construction are the increased thickness of Portland concrete base under the ties, and the use of the bevelled edge Nelsonville stretcher brick outside of the track.

Objection may be made to the use of the stretcher brick outside the rail, as this may start a rut along the rail. The bevel stretched in combination with the wood strip under the head of the rail is intended to keep the rail from direct contact with the brick and to reduce the effect of vibration and prevent the paving being crushed by wide tread wheels.

Asphaltum filler has been used on brick paving in Indianapolis and has its advantages in cases where traffic cannot be kept off the paving or tracks for sufficient time to permit cement grout to fully set. Several makes of asphaltum filler have been tried, as well as coal tar pitch. Later we will have some data as to their relative merits.

About 8,000 square yards of brick paving was filled with asphaltum filler during 1908. This paving is subjected to heavy traffic and great effort was made to do as good a job as possible. The work was done with every precaution suggested by the representative of the asphaltum, the city engineer and the engineering department of the street railway to make it first class. Two blocks of the same stretch of track are grouted with Portland cement. A direct comparison of results can be made. At present both stretches of paving are in fine shape.

The wear on brick paving starts from the breaking of the edges of the brick at the joints, rounding the edges till the brick resemble cobble stones. This is noticed especially when the wear is from the shoes of the animals, the wear from wheels being practically uniform across the face of the brick. The round edge commonly used is a mistake. Brick should have as little rounding as possible on the edges.

The greatest possible effort should be made to fill the joints full with the best grout. Ordinary grouting is the ruin of a brick. Five cents a square yard spent on good grouting is the best investment on the job. In going over pavement it will be seen that the best paving is that in which the grouting is best. The city engineer and myself have seen parts of brick pavement that have kept smooth under heavy traffic when the balance of the paving was worn rough; the only explanation for the different condition was the grouting.

The following method is suggested for grouting: Mix 1 to 1 cement and sand in a box, using always a measured amount of sand, cement and water. Mix thoroughly and dump the box. Sweep the grout on diagonal lines and use a rubber squilgee instead of a broom. After the grout has settled down in the joint go over it again, repeating until the joint is full and flush after the initial set.

The price paid for brick is probably too low; a smaller brick more uniform in structure and burn is preferrable. Such brick should be very closely inspected; possibly 40 per cent. of the brick now classed as No. 1 should be rejected. If the size were smaller these brick would be used in building, thus providing against loss by the maker. The manufacturer should grade his product to give the customer the qualities needed and himself reject the poor brick.

Inspection for quality as the brick are laid is unjust to both parties. As the eye can only decide shape, color and possibly absorption of water, many brick that would be satisfactory are rejected and unsatisfactory brick are scattered throughout the paving. The inspector should have the advantage of judging the brick from their position in the kiln. A better market for second class brick will have to be found before the manufacturer can be expected to grade closer or else the price must be better. Both the manufacturer and his customer should be insured against the expense of freight, unloading, hauling and storage on rejected brick.

Up to the present time no granite or stone block pavement has been used in Indianapolis. The traffic, however, on several streets now paved with brick is so heavy that a block pavement is needed. The street railway has 8,000 square yards of block pavement under construction on Kentucky avenue, south of White River.

The block selected is from quarries 60 miles east of Pittsburg and known as Ligonier block. This is a very tough limestone. The block is laid on concrete foundation and the joints filled with pitch. The pitch to be used will be hydrolene, 80 per cent., and residuum oil, 20 per cent. The stone blocks are smoothly cut and the pavement will not be materially rougher than brick. The block does not glaze or get slippery under traffic. Block will eventually polish when exposed only to horse travel but if laid smooth will remain so under wheel traffic.

Paper read at the recent convention of the Central Electric Railway Association.

[illegible] The secret of a good block pavement is in the cutting of the blocks with smooth faces and square edges. The blocks must be laid close with the joints filled with filler. If the pavement be as smooth as [illegible] would be obviated largely and the pavement would continue smooth even when worn by traffic.

[illegible] stone block has the great advantage that the pavers can be replaced after track repairs at small expense and the general condition of the street is not impaired as in asphalt or brick surface.

The maintenance of track and paving always presents the difficulty that a minor repair to track cannot [illegible] large paving expense. In other cases reconstruction of the paving cannot be made because the condition of the track will not justify it and enough money to rebuild both is not at hand. In other words, a worn out pavement on a street with a two-thirds worn out track presents a difficult financial problem. There should be some cheap pavement invented to use for such short time work. This problem is frequently presented on interurban lines in small towns in which ordinary T-rail construction should be paved.

The success of pavements of the bitulithic class seems to indicate that something can be expected in this direction. Assuming that the track roadbed is good enough for a foundation, if a 4 or 5-inch layer of bituminous macadam could be cheaply laid and cheaply and easily be repaired by ordinary section men it would solve this trouble. The patents seem to tend to prevent the use of the usual forms of such pavements under these conditions.

One proposition of this kind is presented by an asphalt contractor. He suggests a layer of clean macadam laid and rolled in place with a light roller, then poured with a hot asphalt. This is to be followed with a layer of ¼-inch stone, also poured with hot asphalt, then coated with sand and cement and rolled with a heavy roller.

For this proposition no great plant would be required. A closed heating kettle of two tons capacity with a hand agitator can be purchased for $700. The grading of the macadam can be cheaply done. It has been estimated that such a pavement could be laid at 50 cents per square yard, and subsequent patching could be done by section men at the same cost. This would give a pavement suitable for light travelled streets where the traffic largely avoids the car tracks. The cost of maintenance would be so small that it would not be neglected.

The need of to-day for small towns is a cheap yet reasonably durable pavement that can be repaired when necessary by ordinary labor with a small expenditure for plant. The macadam country road fails under automobile traffic. The need is now for a cheap cementing material.

Paving Material in Various Cities

Wood blocks or asphalt for heavy traffic and bitulithic and a light type of asphalt for lighter traffic is the advice which the city council of Victoria, B.C., has received in the matter of street pavements. Assistant City Engineer Bryson, who was commissioned by the city council to look into the types of pavements in use in eastern cities and report thereon, submitted his report at a recent meeing of the council. Mr. Bryson's investigation is set forth in the following report:

Ottawa, Ont.

In Ottawa, Ont., tme pavements chiefll in use are asphalt, bitulithic, sandstone and wood blocks. Sandstone blocks being [illegible] The principal thoroughfares are paved with asphalt. Where car tracks exist, the allowance is made with sandstone blocks. On several streets bitulithic has been successfully used. Various bridges are paved with wood blocks, but this class of pavement is not used for streets. The city owns its own asphalt plant and does all repair work and is in a position to submit competitive tenders with contractors.

Montreal, Que.

In Montreal, where heavy grades exist and where traffic is exceptionally heavy, granite and scoria blocks are used. The principal thoroughfares are paved with sheet asphalt blocks, this class of pavement giving every satisfaction. Hassam has been used in two blocks.

Toronto, Ont.

In Toronto the paving materials chiefly used are wood blocks, bitulithic, bric, sheet asphalt, asphalt blocks and concrete. Sheet asphalt (heavy, medium and light) is used for all classes of traffic, but not on heavy grades, vitrified brick being used on streets where heavy grades exist. Bitulithic is laid down when a fully signed petition is received from property owners asking for this class of pavement, which has proved very satisfactory, being less slippery than asphalt. There are not many streets paved with wooden blocks, but where this pavement has been laid it is satisfactory. Concrete is used for paving lanes and small thoroughfares. The city has a complete asphalt plant which carries on its own repair work. The vity also submits tenders against contractors.

New York, N.Y.

In New York the principal paving materials in use are ahphalt, granite blocks, Belgian blocks, asphalt blocks, wooden blocks and brick. Sheet asphalt and granite blocks may be regarded as the standard paving material for this city and are used in all classes of streets, granite blocks being used where traffic is heaviest. Wooden block pavements are also popular and are giving good results.

Calgary, Alta.

In Calgary, wood blocks, bitulithic, asphalt, granitoid have all been laid. In the case of the wood block pavements the blocks were imported from the States and laid by an American company, and the pavements are in first-class condition. The bitulithic pavements are laid on concrete base and are also in good condition and popular. Granitold pavements are used on the subways and streets where grades are heavy, and are standing well. Asphalt here is laid on a concrete base and also the Worswick asphalt concrete pavement, both of which are giving extra satisfaction. The latter type is satisfactory for residential streets where the subsoil is firm and resistant, and is considerably cheaper than that laid on a concrete base.

From my own observations and information gathered from the various city officials, I am of the opinion that granite blocks, sandstone blocks or brick are the most suitable pavements for heavy grades

I consider the most suitable pavement for Victoria to be wooden blocks and asphalt (heavy type) for the heavier traffic and bitulithic and asphalt (light type) for lighter traffic. I would recommend in all cases where street railway tracks exist that that track allowance be paved with vitrified brick, sandstone or granite blocks when asphalt or bitulithic is used.

In conclusion, I wish to express my thanks to J. R. Barlow, City Surveyor of Montreal; Mr. Child, City Engineer, Calgary; N. J. Ker, City Engineer, Ottawa; C. H. Rust, City Engineer, Toronto; Geo. A. Johnson, S. W. Whinery and Rudolph Hering, consulting engineers, New York.

Permits issued at Port Arthur, Ont., during 1909 amounted to $584,810. This total only covers buildings erected inside the first fire limits, for which permits are necessary. The value of buildings outside these limits, we are informed by City Engineer Antonisen, would probably amount to $300,000. A very busy season is in prospect.

Criticism of New Quebec Bridge Plans

"Scientific American" Terms Design "Commonplace" and Inferior to that of the Forth Bridge Built in Last Generation

The new plans for the Quebec bridge are a fruitful ource of criticism on all sides. In a recent issue of e "Scientific American," a writer reviews the condions relating to the partly completed structure that colpsed, and deals with the circumstances leading to the penditure of $150,000, and the consumption of eighteen onths' time, to produce the present plans. Of these e writer asserts that the design is "commonplace" and lds that there is a general professional opinion that th structurally and aesthetically it is distinctly inferior the Forth Bridge, which was completed nearly twenty ars ago. The writer then continues:

"If the bridge is built according to the proposed plans will not only be of inferior merit, considered from the idge engineer's standpoint, but will also be the ugliest idge of monumental proportions among those hitherto prosed or built. It presents the appearance of a monotonous esh of triangles and straight lines. From abutment to abutent there is not one graceful line in the whole structure: t the slightest attempt to combine the beautiful with the eful. The faulty structure which collapsed had at least e redeeming feature that the outlines were structurally and sthetically correct; and although the Forth bridge has been ade the subject of much criticism by the artist and the chitect, it must be regarded as having distinct claims to auty when compared with the new plans for the Quebec idge.

"It would seem, however, that the Board has some doubts to the merits of its own work; for it now invites competive plans from contractors, which are to be filed by May 1st, 10, the plans to be drawn at the contractor's own expense. ut if the Board has taken 18 months' time and spent $150,000 produce the present plans, the public will naturally ask. low can the Board expect responsible firms to furnish them th new plans in one-sixth the time and for nothing?'

Forth Bridge Design

"Those of us who knew the late Sir Benjamin Baker, the uilder of the Forth bridge, and were familiar with his cautious ethods, will agree that, could he have been consulted, it is ore than probable that he would have disapproved of the resent design; as he would surely have condemned the old e had it been submitted to him. In his Forth bridge the idth at the base of the towers is 120 feet for a span of 1,700 et, which gives a ratio of 1 to 14. This large width at the wers is necessary to ensure the stability and lateral rigidy of the entire structure under wind pressure [illegible] les; and particularly is this provision necessary to ensure fety during erection. The bridge which failed was only 67 et wide, and this small width was a [illegible] he twisting of the structure during erection, which preded its collapse. This important fact does not seem to have en given sufficient consideration; for the new structuer has a idth of only 88 feet, or 1-20th of the proposed length of pan of 1,758 feet, as against 1-14th in the Forth bridge.

American Experience

It may be claimed that experience with American prace in cantilever railroad bridges has shown a proportion of to 20 to be sufficient; but it is a question how far their mmunity from disaster during [illegible] nate circumstance that no strong winds were experienced uch as frequently occur at the Forth bridge, [illegible] t Quebec, which would have [illegible] Moreover, [illegible] is a fact that there is not a large cantilever railroad bridge on this continent over which trains dare run faster than 25 miles an hour. The vibrations, due to the narrow width, would become excessive, and at faster speeds would create danger of derailment. On the other hand, the advantages of great width in proportion to length are shown by the fact that the fast and heavy express trains in the north of Scotland pass continually and with absolute safety over the Forth bridge at [illegible] miles an hour.

Weight for Weight's Sake

Another [illegible] in the specifications upon which bids are invited, which is puzzling engineers and contractors, is that the maximum height of the towers has been limited to 290 feet above the masonry. It really would seem as though the board of engineers who drew up the specifications were desirous to put weight into the new bridge merely for the sake of having it there; for it is well understood that the stresses in the top and bottom members of a truss, and therefore the amount of steel necessary to meet these stresses, increase inversely as the depth, and hence the shallower the bridge, the greater will be its weight. In view of these facts, it is extraordinary that in the specifications the maximum height of the towers above the masonry should be limited to 290 feet. This height in the Forth bridge is 330 feet, and in the Quebec bridge which fell it was 315 feet. The low height of 290 feet necessarily increases the weight of a cantilever, and if used for the towers of a suspension bridge would result in a flat catenary, requiring unusually heavy and expensive cables and anchorages. The great height of the towers and trusses in the Forth bridge has an important bearing upon its rigidity under fast trains.

The Structural Weight

[illegible] weights is shown in the fact that the amount of steel to be put into the Quebec bridge in a length of 2,800 feet is estimated at over 66,000 tons. The total amount of steel in the Forth bridge in a length of 5,300 feet is 63,000 tons. In other words, the narrow Quebec structure would require the enormous average amount of 24 tons of steel (about half of which moreover is nickel steel) per lineal foot, whereas the wide and rigid Forth bridge required an average of only 10 tons of carbon steel per lineal foot. It is true that the train loads assumed for the Quebec bridge are about three times as heavy; but it is well understood that the weight of steel in any bridge of great span does not increase in anything like the [illegible]

Architects, engineers and contractors will be interested in a new line offered by the Barrett Manufacturing Company, New York. This is a reinforced felt called "Tartex," specially adapted for use for waterproofing where tensile strength [illegible] sent to the "Contract Record" last week. It is pliable and [illegible]

Estimating Plaster and Painting Work

In estimating plaster work, the first thing to be considered is the amount of mortar and lime required for every superficial yard of surface plastering, and the amount of time in its preparation and manipulation. The carriage of material is also an important matter, and the facility for its application upon the different parts of the building. There are some buildings which require more scaffolding than others, and although the plasterer in general does not supply the main scaffolding or that for his own special use, yet it is incumbent upon him to remove it from place to place as necessity demands. This requires considerable time, so must be allowed for according to the exigencies of the case. Again, the different loads of plaster require a certain time to be properly performed, and it is for the plasterer to consider this in estimating. Then there is the moulding of the stucco cornices and ornaments. The time in their preparation, as well as the material used, and the labor entailed in their setting up and mitering are to be duly considered. The making and setting up of plaster columns and pilasters, and the formation of arches should be carefully calculated as to the time employed in their construction. The formation of all heads, enrichments, arrises, mouldings and centrepieces should be calculated according to the labor expended and the material utilized. There are a few kinds that the plasterer would do well to give his careful attention to, as they will enable him with greater facility and accuracy to come to a proper estimate of his work.

Estimating Painters' Work

In the estimating of painter's work the first consideration is the material to be painted, then the necessary preparatory work, and the time and paint materials, and every requisite for the proper execution of the work. There are some materials which require more time in preparation than others and their constituent elements and the manipulation of the same may produce a smoother surface and therefore the painting may be done with greater facility and be more effective. When we consider first the interior woodwork of a building, we must take note of the "knotting" and "puttying" required to be done on wood where there are knots and cracks or other blemishes. The time and material used in these processes have to enter into the calculations in estimating, also the accessibility for performing the work. In general, ordinary steps may be used for the painting of interiors of houses, but in churches, halls and public buildings sometimes extensive scaffolding has to be erected. Such should be made a separate item, and priced according to the time and material employed in erection and removing same. There is also greater time occupied in painting work at high altitudes, and where scaffolding is used, than in doing work upon the ground, as the more perilous the position the greater caution is to be exercised. The interior decorations require considerable time in their execution and according to the complex or simple character of the design and the dexterity with which it can be performed, will the calculations be made in estimating. All exterior work, in general, requires more time in execution, especially in roof work, where ladders are frequently to be removed and caution xercised. It depends greatly upon these important features for consideration, and the distance to be travelled to and from the job, that an approximate estimate may be obtained of the work to be executed.

Permits issued at Vancouver, B.C., last month totalled $631,311, covering 144 applications, as against a total of $365,630 and 109 permits during the corresponding month of 1909.

Notes on School Plumbing

By A. C. SHAVER, Inspector of Plumbing

Sanitation in our public schools is receiving far more consideration than at any time in the history of architecture. Not only is this true in regard to the modern systems of heating and ventilating, but also in the wonderful improvement in plumbing, both as regards the drainage system, water supply and fixtures. While formerly plumbing fixtures were placed in badly ventilated, poorly lighted, out-of-the-way places and used only as a necessity, they now occupy a more prominent place and have become a luxury as well as a necessity.

When it comes to a question of plumbing, the schools where the boys and girls of to-day are learning the responsibilities of the men and women of to-morrow, it ought to be a self-evident proposition that the best can be none too good. A city's educational institutions should reflect the very highest state of knowledge and practice of sanitary engineering—partly because they are educational examples of public buildings as well as places of where education is imparted; also because children have no power of choice in the design or construction of the plumbing in the schools they attend. The municipality is morally responsible for the health and comfort of the children who attend its places of public instruction.

It is not enough that the plumbing fixtures be sanitary; they must be such that the children take pride in them and feel a sense of responsibility in keeping them clean. The public drinking cup has always been a source of trouble on account of the possibility of the spread of disease, but this has been overcome by the introduction of the bubbling pedestal drinking fountain in which no cup is used; the child, leaning over, drinks out of a bubbling stream of water, no part of the lips coming in contact with the fountain. The improvements in plumbing fixtures have driven out the old latrine closets and the more antiquated systems with their large fouling surface, and have created a demand for the more sanitary and up-to-date work; the individual, seat-action, syphon jet closet, with its tank and bowl of vitreous ware, is probable giving the best satisfaction, and when installed in a well-lighted. well-ventilated room is a mode of sanitation. If the privilege of using modern fixtures in a clean, ventilated room shall teach our children any thing toward cleanliness and care of property and do any thing toward raising the standard of sanitary knowledge any extra amount paid is well invested. The policy o putting high-grade material in rooms to be used for toile purposes has often been assailed by unthinking per sons, and probably often will b e ;but it is certainly a ste in the right direction, as it is a saving in repairs, lengt of service and the ease with which it is kept in a cleanl condition.

Owing to the nature of the waste that enters th urinal, it is the most difficult of all toilet-room fixture to keep in a clean and sanitary condition, and the fo air noticed in many public toilet rooms is due largel to this fixture; but this can be overcome by the prope selection. A urinal should be of a non-absorbent materi such as slate or solid porcelain, and the water so de livered as to have a scouring effect on all parts; th local vent so arranged as to draw the air downwar across the bowl or trough, as the case may be, and e haust back of the urinal slab in a foul-air flue installe for that purpose. With this installation we do not g the foul odors, as they are drawn downward and nev reach the level of the face.

Mr. Owen W. Smith, formerly of Messrs. Galt Smith, Toronto, has moved to Winnipeg, Man., whe he will be identified with a large contracting firm.

Functions of a Live Builders' Exchange

To Bind the Employers Together, to Promote and Protect Their Interests and to Extend the Present Sphere of their Influence

By GEO. S. GOULD, Secretary, London Builders' Exchange

The social department of the Builders' Exchange work is ne of the chief factors to be considered, consequently it beomes one of the first duties of every organized exchange to rovide suitable rooms for the use of its members—for social s well as for business purposes. These rooms should be made o attractive and comfortable, that the members will gladly vail themselves of the use of them in their leisure hours. 'rovision should be made for as many modes of recreation s the space in the rooms will permit, and for those who deire more quietude, a reading room is most desirable. In a ord, the exchange should provide all the advantages of an rdinary club membership—without its bad features.

Besides the ordinary benefits to be derived by any other lub membership, exchange members have this in common: hat they must derive their business through the same chanels. Consequently, by meeting together frequently, in a ocial capacity, they learn to know each other better. Confiences are exchanged, valuable information imparted, and lose friendships formed between competitors in the same alling. This would never occur by their meeting only as ivals in business.

As all the members have to derive their living from the ame sources, it is to the interest of each, to see that the venues to those sources be kept clear of all obstructions; or whatever diverts a legitimate tender from receiving its ust consideration and award, is an obstruction to the best nterests of every exchange member. Whenever a principle, hat makes for "fair competition," is assailed, it should be lealt with at once, by the Builders' Exchange. If this were nore general, the result would be that improper interference vith the awarding of contracts would soon be abolished.

It is necessary for the discovery of attempted wrongs, that ach member place full confidence in the other. Misrepreentations are often made by unscrupulous clients, and conractors are apt to be misled unless they are wise beforehand f in the making and submitting of his tender, the bidder is overned by fair and honest principles, he should not be averse o making comparisons immediately after the time for reeiving prices has expired. Such comparisons frustrate malractice in contract awards.

Combined with the element of good fellowship, the work f the Exchange is educational. In none of the gatherings is alking shop barred, and an observant listener can always ick up useful information when the different practices emloyed in his own branch of work are being explained.

Young beginners in contracting, especially, are benefited y regular attendance at the meetings, and even contractors who have grown grey in their calling, can still be learners as well as teachers in the rooms of a live Builders' Exchange. In addition to any information that may be obtained locally, they will find on the tables many reputable trade journals whose business it is to cater to the building trade. The editors of these journals keep in touch with all that is to the best interests of contractors, and their columns contain most valuable information.

In addition to the advance news concerning proposed building construction, tenders wanted, and contracts awarded, some very interesting and profitable articles will be found in their pages, such, for instance, [illegible]: "The best methods to be employed for estimating"; "Shall contractors be remunerated for figuring?"; "The best methods of keeping builders' accounts"; and "Should a tender be awarded to the lowest bidder, or to the lowest but one?" A careful consideration of such questions as these will certainly develop thought. These journals also keep contractors in touch with trade difficulties and labor disputes, and generally, are a source of much help to a Builders' Exchange.

The educational work of the Builders' Exchange should not be confined to its own members, but should be far reaching, extending even to the legislative halls. Realizing, as builders do, the ever growing need of skilled labor for building construction and being cognizant of the decadence of the apprenticeship system, they should lend their influence towards establishing trade schools in different sections of the country, where, in connection with a public school education, our boys might receive elementary instruction in all branches of building construction and a sufficient practical knowledge of each to admit of their being readily placed out with reliable contractors as students under instruction for one year, and improvers for the second year, with a diploma for proficiency at the termination of the third year. The legislative committee of every exchange should press this matter strongly upon their representatives in Parliament.

The social and fraternal privileges of an Exchange are not entirely local. Any member in good standing, who may have to do business in any place where there is a sister Exchange, will receive a fraternal greeting and courteous treatment while there, and in addition, may enjoy all the privileges and benefits of the Exchange rooms in that city.

The question is sometimes asked, "What good is the Builders' Exchange?" What would be thought if one of our merchants or bank managers should ask, "What good is a police force?" The Builders' Exchange exercises services for the building contractor, somewhat similar to those performed for the general public by the police department.

The Federated Builders' Exchange affords the only protection the builder can ever get against the unjust demands of a united labor party, such as trying to compel a contractor to have the "union label" on every job; limiting the number of hours a man may work; limiting the amount of work to be done, and demanding increased rates per hour. The Federated Trades and Labor Council take their demands right to the Provincial and Federal Parliaments. They have the loyal support of every member, and consequently their measures are likely to be passed without much trouble unless strong opposition is brought to bear against them by the [illegible]

The Exchange does more for a contractor than merely to protect the rights and privileges that he already enjoys. Its great aim is to secure for every building contractor every advantage possible to enable him to carry on his business successfully. This means carefully watching the changing conditions and methods in building construction and keeping the members abreast of the time. It also means that they have not only to resist all unfair legislation but to promote and advocate laws that will be both just and advantageous to the [illegible]

The Builders' Exchange of London, Ont., since its formation, has been the means of benefiting every contractor in [illegible] as well as in other ways, and it is still performing the good work. It is not yet 15 years since it [illegible]

[illegible] of the contract forms that the architect uses. [illegible] a man handed the key of his [illegible] his agent and left himself completely [illegible]. Now he can fearlessly sign his [illegible] its provisions are just. Then, he paid [illegible] to one per cent. for fire insurance [illegible]. Now he pays nothing, a saving [illegible] a year. Then he had a worthless lien [illegible] standardized in that law. But I [illegible] enough to show that the Builders' Exchange has been a benefit to the industry in London.

There is abundance of work to be accomplished, and I [illegible] contractor to overcome any [illegible] against any members of his Exchange, [illegible] take his right place in the ranks of [illegible] Association of Building Contractors.

Mr. Arthur E. Nutter

City Architect, London, Ont.

Mr. Arthur E. Nutter, city architect of London, Ont., [illegible] of the same name. His professional [illegible] commenced in 1892, when he was articled to C. R. Ashbee, M.A., a well known architect with a reputation as an artist and author. While serving his articles, Mr. Nutter enjoyed the advantage of Mr. Ashbee's high class practice and of being associated with the erection of numerous large town and country residences, and public buildings. After touring Great Britain and the Continent in the acquisition of ideas pertaining to his work, Mr. Nutter engaged in a country practice of architecture and land surveying with Mr. F. G. Hughes, of Hampton-on-Thames. Later, he was engaged by the Archæological Survey in connection with ancient manor houses and churches in the county of Surrey. Following this, he undertook various architectural work at Plymouth, and later located at Liverpool, in practice with Mr. T. M. Shallcross. In 1901, he was elected an associate of the Liverpool Architectural Society. While at Liverpool, Mr. Nutter designed, among other important buildings, the Liverpool Artillery Volunteer Headquarters.

Mr. Arthur E. Nutter, City Architect of London, Ont.

The fortunate year in Mr. Nutter's career was 1907, when he purchased a partnership at London, Ont. On February 3rd of the following year he was appointed city architect and deputy inspector of buildings. In 1908, Mr. Nutter designed and supervised the construction of the Victoria Isolation Hospital at a cost of $52,000. This building is considered by the provincial authorities to be one of the best of its kind in Canada. In the same year, the Victoria Hospital laundry, costing $6,000, and fire halls Nos. 4 and 5, costing $14,000, were erected according to Mr. Nutter's plans—these in addition to other public work. 1909 witnessed the erection of the Smallpox Hospital and the Wortley Road public school; also additions and alterations to many city buildings.

Mr Nutter, like most good men, has a hobby: he is fond of aquatic sports. At Liverpool he had the reputation for being a keen and able yachtsman. He was then the owner of two trim yachts, of 10 and 15 tons respectively.

Progress and Future of Good Roads Movement

Interviewed in Toronto last week, prior to his departure for Ottawa, Mr. A. W. Campbell, the new Deputy Minister of Railways and Canals, said in part:

"Road improvement is one of the most important matters which the Province of Ontario has to face, as well as many older countries. The weakness of the present situation is every year becoming more apparent to the public. Statute labor with municipal money grants have for a century been employed, but township systems, based on this method, have proven inefficient. There is a most important work for the province as a whole, cities and towns, to perform in this regard.

The Key to All Transport

"This is the view which has been forced upon me by a close study of the transportation question," continued Mr. Campbell. "While engaged in the battle for good roads, a careful study of the entire field has been necessary. Railways and canals are necessary in their place, but they are not by any means the whole equipment of traffic. Without good roads for primary transportation, railways and canals are useless. They are of service only in so far as they are fed by the greater network of country roads, and the volume of railway and canal traffic is an index to the condition of the country roads. In a period of bad roads, railways are comparatively idle. When the country roads improve, the volume of railway traffic expands proportionately.

"Since taking up the question of better roads some years ago, it is gratifying to me to reflect that something of a permanent nature has been accomplished; that the pioneer stage has been successfully passed, and that the way has been prepared for a satisfactory outcome. In the initial stage of the good roads movement, all discussion of the question was met with opposition and prejudice. It was an important but, at times, almost discouraging task to convert this prejudice into sympathy, and sympathy into action and co-operation.

Unfavorable reference to statute labor was at first a dangerous matter before many audiences; while such a thing as a county system or provincial aid was impossible as a suggestion.

An Educational Campaign

"In this work, it was not possible, nor have we sought, to force new systems and methods upon the people. Until they themselves saw and understood the wisdom of a change, they were not in a position to efjectively use the means [illegible] into effect.

"To briefly summarize, however, we may say that about one-quarter of the townships of the province have discarded statute labor. One-half of the eligible counties have established county systems of main roads; and the principle of provincial aid to road construction has been established. In every part of Ontario, even where statute labòr is retained, the campaign of education has had its effect, and improvements of an important kind are to be observed.

Systems of Management

"Criticism is occasionally heard," added the Deputy Minister, "as to the success of county road systems. That is to be expected. No merely human creation can be perfect. But undoubtedly the country road system is the most successful that has been undertaken. The roads built are not uniformly good, but that they are improved to a degree reasonably commensurate with the expenditure upon them, is undeniable. The aim has been to establish good systems of management, and get the best results from the expenditure made. Counties which spend only $600 a mile cannot build as good roads as those which are spending $2,000 a mile, but there has been improvement proportionate to the outlay.

"County roads are only a beginning, not the end. Under the township systems there was a series of patchwork. No real commencement was made, and the result was that little was accomplished. County roads, aided by the province, form a substantial beginning on a methodic basis that will eventually result in the permanent improvement of all the roads. They are object lessons; and as an argument for extension, a completed system of main county roads is an invincible argument.

"It is to me a matter of regret that I am leaving the more active field of operation in behalf of the Good Roads Movement," concluded Mr. Campbell. "But, on the other hand, it is gratifying that I am still to be engaged in the great question of transportation, of which good waggon roads are at one end, and canals and railroads at the other. And in undertaking my duties as Deputy Minister of Railways and Canals, and Chairman of the Intercolonial Railway Commission, I look forward to a more intimate and practical knowledge of the entire field of transportation.

"While going to the larger field, my energies and sympathy will always be retained by the Good Roads Movement, and wherever I may be in Canada it will be a pleasure to lend my assistance to those who remain to carry on the work."

Canadian Field is Extensive

The fact that the Canadian field is one of great possibilities for all substantial commercial lines of business, has again asserted itself in the case of the Tungstelier Company [illegible] ganization of the above company some four months [illegible] Mr. R. B. Basham, general manager, with the benefit of his twelve years' experience as a lighting expert, has [illegible]

The head office of the Tungstelier Company is now [illegible] King street west, where the many conveniences of larger offices, more complete in their appointments, provide for [illegible] fices will be equipped with apparatus for demonstrating [illegible] vited. In correct illumination, a proper reflection and [illegible]

The Late Thomas Douglas, Toronto

We regret to report the death of Mr. Thos. Douglas, of the firm of Douglas Brothers, Toronto. The late Mr. Douglas was born in Ireland 65 years ago and came to Canada at 15 years of age. In 1872 he commenced the business with which his name has ever since been associated. As a sheet metal contractor he was held in high esteem in building circles. Among the important buildings in connection with which the Douglas firm obtained contracts are the Parliament Buildings, City Hall, Union Station, St. James' Cathedral, Canada Life Assurance building, Canadian Bank of Commerce and Customs House, Toronto; Dominion Parliament Buildings, Ottawa, and the Grand Trunk Offices, Montreal. In later years Mr. Douglas branched out in Montreal, where he secured many important contracts connected with such buildings as the Macdonald College, the harbor sheds and the Windsor hotel.

One of Mr. Douglas' earliest contracts was the roofing of the St. James' Cathedral spire. The spire had to be covered with iron from the outside. Rather than ask any of his men to undertake this task, which was one of hazard and responsibility, Mr. Douglas did the work himself, and for several weeks he could be seen suspended by a single rope upwards of 300 feet above the sidewalk. It goes without saying that the work was completed satisfactorily.

Cost of Manufacturing Cement in England

In a paper on the design and operation of modern cement plants in England, read before the Junior Institution of Engineers, by Mr. Harry Horsburgh, Assoc. M. Inst. C. E., the writer states that the rotary kiln has been the means of bringing down the price to a very low figure; in fact, Portland cement can now be made on the works for $2.64 to $2.88 per ton, according to Mr. Horsburgh, this sum, of course ,being exclusive of interest on capital, depreciation of plant, and sales expenses, etc. For a dry process rotary plant working on marl the figures run as follows: Labor, 90 cents; coal (kiln), 90 cents; coal (power), 38 cents; repairs, (materials), 30 cents; manufacturing sundries, 24 cents; oils and grease, 6 cents; extras (lighting, labor, office expenses, etc.), 32 cents; total, $3.10 per ton. The figures for item labor are based on the following rate of wages: laborers, 9 to 10 cents per hour; stokers and drivers, $6.72 to $7.68 per week of 56 hours; burners, 18 cents per hour. For fuel for burning the coal would be charged at $2.88 per ton delivered, and on a quantity consumed equalling about 30 per cent. of the clinker made, weight for weight, the figures being taken on the wet coal. Coal for power varies very considerably, the 38 cents being based on steam power. On gas power a plant can be run at 24 cents per ton of cement. With [illegible] for oil, belts, etc., to be supplied at so much per ton [illegible] etc., $3.60 per ton (about 45 cents a barrel) is a ver[illegible]

Personal News and Notes

During 1909 buildings to the value of $101,000 were erected at Grand Forks, B.C.

Mr. Geo. A. Crain, ex-president of the C.N.A.B., is taking a holiday at Hamilton, Bermuda.

At Chatham, Ont., during 1909, permits were issued to the total value of $105,371, compared with $63,842 for 1908.

Building permits issued at Ottawa last month showed an increase of nearly 150 per cent. over the corresponding month of 1909.

Last year a million dollars was spent in erecting school buildings in Alberta, an increase of half a million over the previous year.

In the United States, the total expenditure for building for 1909 was $857,530,669, a sum larger by $231,082,594, or 36.9 per cent., than in 1908.

The Vancouver Board of Works has decided that the minimum wage paid by all city contractors to their workmen shall be 28 cents an hour for an 8-hour day.

Mr. A. J. B. Halford has been appointed Chief Engineer of the Provincial Public Works Department at Toronto to succeed Mr. R. P. Fairbairn, the new Deputy Minister of Public Works.

At the meeting of the Toronto Island Association last week, Mr. Arthur Dinnis was elected president and Mr. Fred Armstrong vice-president. Mr. Dinnis was also placed upon the Civic Island Committee.

During 1909 over $1,000,000 was spent in constructing 114 grain elevators in Alberta alone, providing 51 new towns and villages with storage facilities. Alberta now has 245 elecators with a total capacity of 8,050,400 bushels.

The city of Ottawa is conferring with Mr. Allen Hazen, the New York expert, in regard to its problem of pure water supply. Mr. Hazen, it will be remembered, designed the Toronto filtration plant, now under course of construction.

Toronto Island is being re-surveyed by City Engineer Rust's department with a view to showing the shore line, which has shifted to some extent since the last survey was made in 1897. The new survey will also show improvements on the Island.

The building permits issued at Halifax, N.S., during 1909, which totalled $630,379, included eight public buildings, one bank building, eleven business buildings and 97 residences. The best month's total of the year was that for March, which was $109,490.

Ex-Ald. Balfour, of Vancouver, a prominent contractor who built many of the bridges on the C.P.R. western system in early days, died recently. He settled at Vancouver in 1885, and built the one million dollar structure over the Fraser river at New Westminster.

Mr. A. W. Campbell, the newly appointed Deputy Minister of Railways and Canals, left Toronto for Ottawa last week. Before his departure, the members of the departmental staff at Toronto expressed their appreciation of him by presenting him with a handsome loving cup

Contract work has beaten the day labor system in Vancouver, and will be adopted in the carrying forward of that city's scheme of street improvement, block graving and sidewalk laying. The Board of Works has adopted recommendations of the city engineer involving expenditures of $212,615.

Hamilton, Ont., recently experienced the novelty of having a mechanic's lien placed on one of its public buildings for the non-payment of an account. Drake & Drake, carpenters, took this method of collecting $168 for work on the new Beach pump house, being unable to obtain the amount from the general contractor.

The annual meeting of the Manitoba Pressed Brick Company, Limited, was held in the company's office at 215 McIntyre Block, Winnipeg, last week. The director's report showed a most satisfactory state of affairs, with a very bright outlook. The company is at present doubling the capacity of its plant at Beausejour, Man. Officers were elected as follows: President, Mr. Angus Browne; Vice-president, Mr. J. J. Vopni; Secretary-treasurer and Manager, Mr. W. Findlay.

Mr. R. P. Fairbairn has been appointed by the Provincial Government of Ontario to fill the position of Deputy Minister of Public Works made vacant by the promotion of Mr. A. W. Campbell. Mr. Fairbairn is an experienced engineer, who has been in the department for 30 years and had charge of much work on bridges and colonization roads. Prior to entering the provincial service, he was employed in the office of the city engineer of London. In 1880 he was appointed assistant to Mr. K. Tully, architect of the department, who was then at work on the new Parliament Buildings. In 1903, when Mr. Robt. McCallum succeeded to the position of City Architect of Toronto, Mr. Fairbairn followed him as Chief Provincial Engineer.

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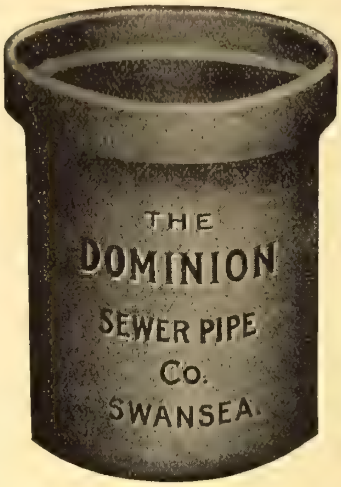

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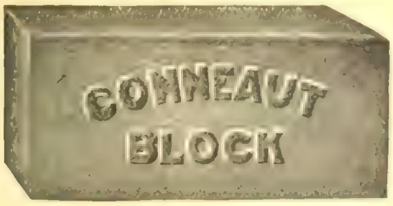

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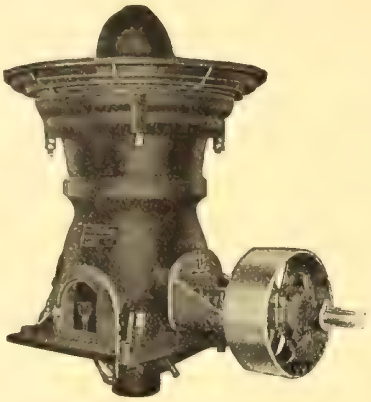

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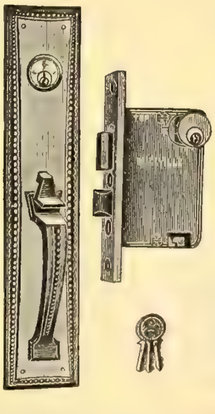

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Current Prices of Building Material.

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The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, for foundation work..	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b. with 30 and 5 per cent. off for wholesale:—

	Star	D.D.
10 to 25 united inches........	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7.25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, any color, ¾-in. square, 1-in. hex. and 3-16-in. round, 35 cents per square foot up.
Floor Tile—½-inch square, 45 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 35 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish, colors, firsts, 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G. cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Brass Goods, Valves, etc.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.
Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.
No. 4 compression bath cock........net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

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Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 70; malleable bushings, 67½; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 67½ per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.
7 and 8-inch pipe, 40 per cent.
Light pipe, 60 per cent.; fittings, 70 per cent.

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Cement, wholesale lots of 1,000 barrels, f.o.b. Toronto, $1.30.
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Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $13.50 to $15 per toise.
Free stone, delivered, $13.50 per toise.
Brown coursing stone, delivered. $3.25 to $3.50 per yard.
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Rubble stone in car lots, $1.20 to $1.25 per ton.
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Pure Green Seal Zinc White, ground in oil, $12.50 to $13.00 per 100 lbs.
Boiled Linseed Oil, in barrels, 78 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 75 cents per gallon of 9 lbs.
Turpentine, in barrels, 80 cents per gallon of 8 4-10 lbs.
Pure Linseed Oil Putty, 25-lb. tins, $3.25 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $2.75 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

A company known as the Masonic Temple Association of Windsor, with a capital of [illegible], has been chartered by the Ontario Government to build a Masonic Temple.

The B. C. Gazette gives notice of the incorporation of the followin companies: B. C. Ornamental Iron & Fence Company, capital [illegible]; [illegible] & Tie Company, capital [illegible]; and Vancouver Gypsum Company, capital [illegible].

The general manager of the John McDougall Caledonian Iron Works Company, Montreal, has written to the Mayor of Quebec in reference to rumors that the company were thinking of leaving Montreal, saying that they had not considered the advisability of removing from Montreal, but if good inducements were offered out to them by Quebec they would be prepared to considered such offers.

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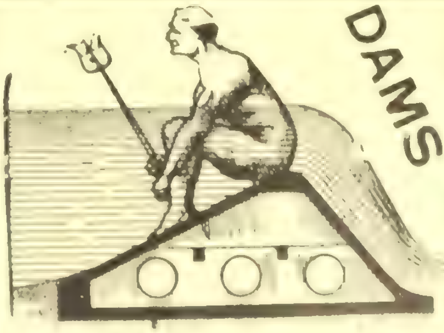

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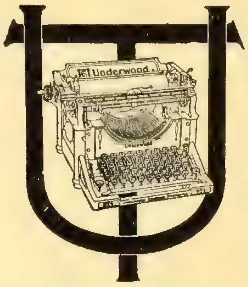

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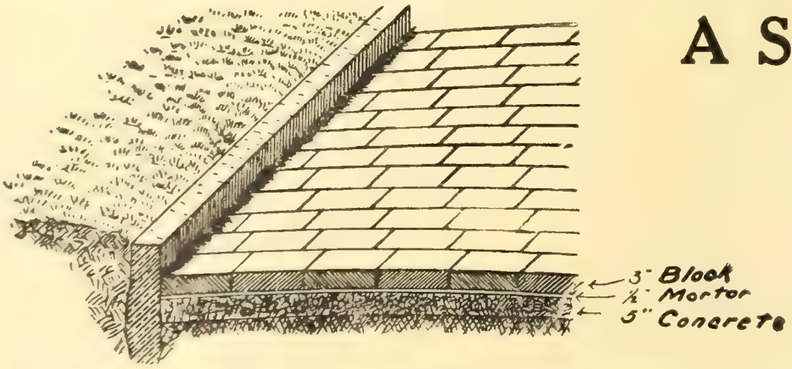

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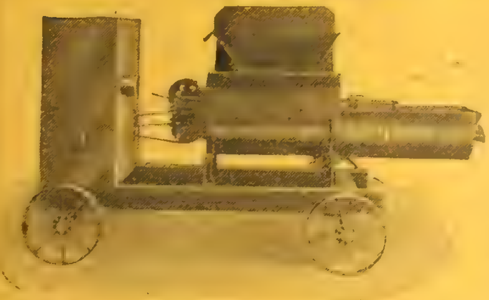

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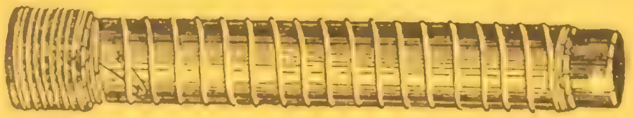

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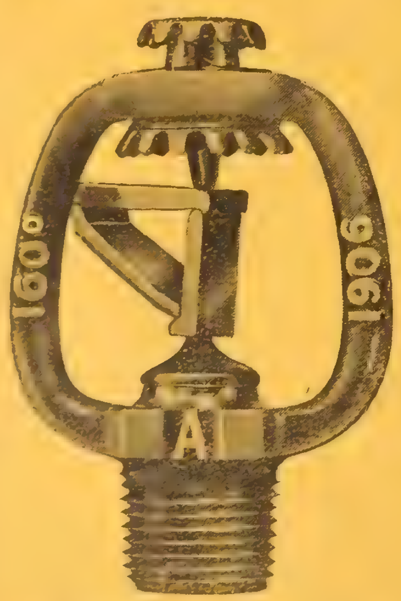

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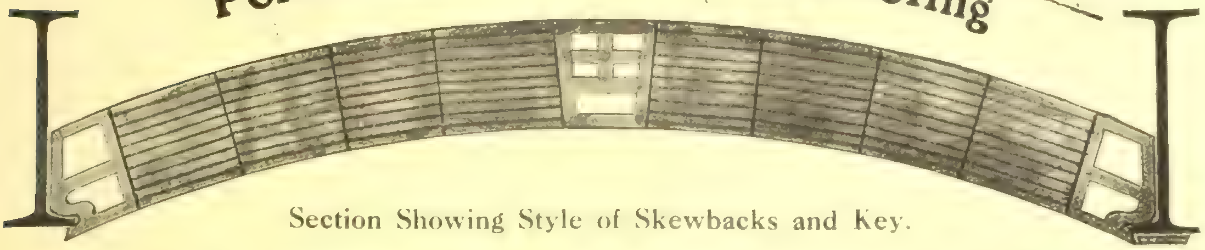

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Dominion Wire Rope Co. 60
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Wire Fences and Screens
Beath & Son, W. D. 7
Canada Wire Goods Mfg. Co. 17
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The Robert Mitchell Co., Limited

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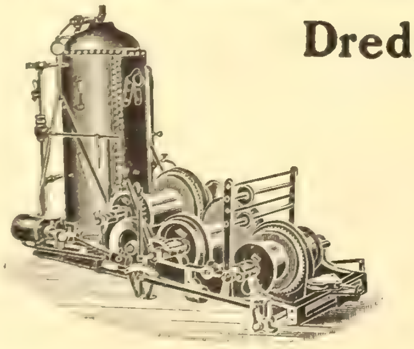
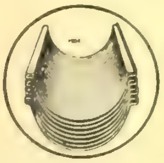


Read why PEDLAR NESTABLE CULVERT

saves farmers money lowers taxes—betters roads

THESE culverts of mine are a great thing for the farming world. They not only make good roads possible, but they serve the farmer in many other ways. And they are so simply laid. They come nested like this:



This compactness saves freight and makes it easy to handle them. You put the sections together like this:

Then you clamp the flanges together like this:

And you've got a piping that will outlast anything of the kind there is. Better get the book and sample and study it.

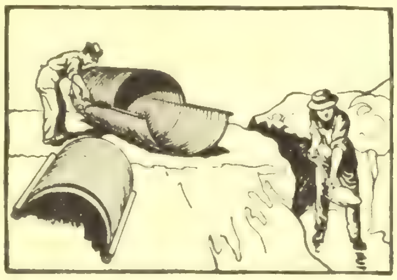
G. H. Pedlar

GET your township reeve or warden to study Pedlar Culverts. Send for the Free Book and show him why this Culvert surpasses for all ditch drainage, for restraining small streams, for every use that any culvert can serve. You will profit through lowered taxes, better roads and abolished washouts. Send for the book and interest your township's officials. You will benefit by what they will learn.

For a very moderate cost you can instal a perfect sewage-disposal system on your farm, using a suitably-sized Pedlar Culvert. You can realize the full value of the liquid manure your animals produce by draining your stable floors with Pedlar Culvert—and that highly valuable manure is usually wasted on farms. Pedlar Culvert makes it easy to water your cattle in winter. And there are a score of other uses for it on the farm.

Nothing vies with Pedlar Culvert as a well-curbing or a cistern lining. The thick galvanizing absolutely protects the metal of these Culverts from rust or corrosion, and the metal itself protects the water supply from contamination. For draining swampy spots around the farm, or for irrigation ditches and under-drains Pedlar Culverts far excel tile or cement piping, are much less costly, much easier to instal and infinitely more durable.

Pedlar Culvert is made in every standard size from 8 to 72 inches diameter, of Special Billet Iron of the the best quality, in extra heavy gauge. This Billet Iron is curved into semi-cylinders—curved while cold, so the sizes never vary a fraction. These half-cylinders are then corrugated by a pressure of sixty tons to the square inch. After being corrugated, the whole surface and each edge is heavily galvanized and made positively rust-proof.



A few hours' work—no special skill needed—and an indestructible culvert is in place ready for use.

PEDLAR CULVERT

is made in Nestable Sections from the Best Billet Iron, heavily galvanized and deeply corrugated.

It is the simplest kind of work to put these half-sections of Pedlar Culvert together permanently. One half-cylinder is placed on another, and the flange-rib on each side is rigidly compressed flat by the huge pressure exerted by a simple but effective tool. No bolts, no rivets, no make-shifts but a triple-thick locking rib-flange that gives Pedlar Culvert immense strength. Thus it will stand crushing strains that would destroy any other piping.

This peculiar flat-flange, triple-thick rib makes the most perfect joint possible—nearly as good as if it were welded. Yet it allows for expansion and contraction under heat or cold. Thus a Pedlar Culvert will not spring nor split even though frozen solidly full of ice. Also the triple rib flange principle makes it possible to break joints in putting this Culvert together, something you cannot do with any other culvert or with cement piping or tile.

Pedlar Culverts are the most portable, as well as the most durable of any piping for any purpose. Being made in half cylinders they [illegible] so that a great many linear feet of culvert occupy but few cubic feet of car or wagon space. This economizes freight [illegible] and makes it easy to transport this Culvert even in rough country. You should get the free book and sample culvert that makes the whole story clear. State your possible needs when you write for the book, and let us quote prices.

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(Largest Sheet Metal Manufactory in the British Empire)

The Pedlar People of Oshawa
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include in the output of their immense factories the below mentioned specialties in sheet metal building material. Samples, literature and prices of any of these will be readily [illegible] and free upon request addressed to the Pedlar warehouse nearest to the inquirer.

Pedlar Nestable Culvert, Oshawa Steel Shingles, Steel Roofing, Corrugated Iron, Metal Siding, Skylights, Conductor Pipes, Finials, Art Steel Ceilings, Art Steel Siding, Eave Troughs, Prepared Roofing, Metal Doors, Metal Lath, Ventilators, etc.

"I cannot doubt but that the manner in which the defendant has offered its goods to the public, advertised them—the similarity of the labels; similarity of combination in catalogue, the use of the word 'STANDARD,' were fitted to deceive the public, and are proved, in some instances to have deceived the public. Nor can I doubt that such deception was the object kept in view by the defendants' manager." — Extract from Hon. Mr. Justice Archibald's judgment in recent suit of the Standard Sanitary Mfg. Co., Pittsburg, Pa., against the Standard Ideal Co., Port Hope, Ont.

In almost all lines of manufacture there is some recognized leader, some brand that dominates the field because of its proven superiority. In their anxiety to imitate us in every particular, the defendants in the above action have attested that in Porcelain Enamelled Ware "STANDARD" fixtures represent the highest degree of perfection.

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Contracts have been let for twelve additional gang saws, as well as larger engines, and increased boiler capacity. These additions should be complete by the middle of May, and we shall then be able to handle promptly a very much increased volume of business.

We appreciate the support we have had from a very large number of the leading Architectural offices, and we are using our utmost endeavors to merit it.

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All Floors in this Building are Reinforced Throughout with

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Dominion Concrete
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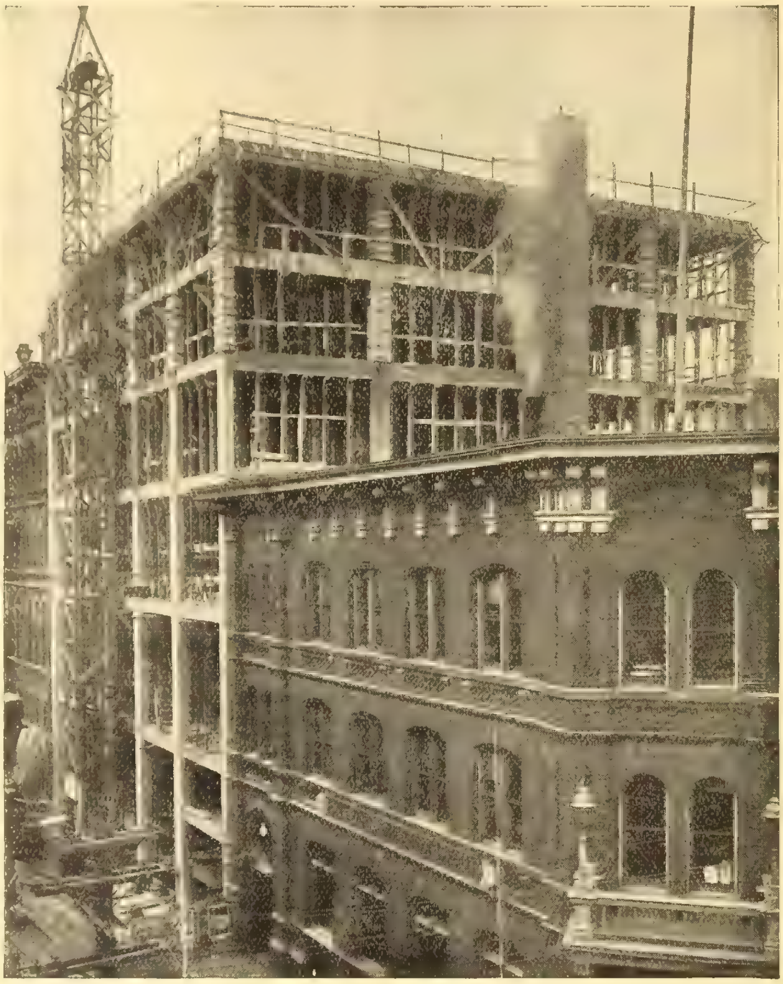

Cut shows Reinforced Concrete Building under construction for the Thomas C. Watkins Departmental Store, Hamilton.

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are delighted with its perfect finish and elegant appearance and will use no other. Only the best lumber is used. We are equipped and have the workmen to turn out the highest class of "hardwood flooring" on the market.

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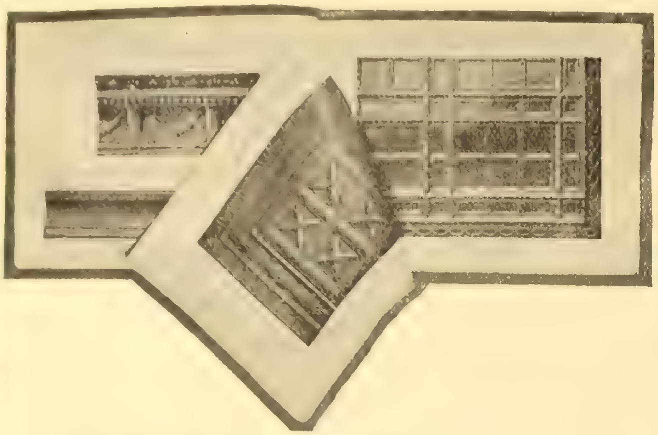
Metal Ceilings

Have You This Catalog?



Our new catalogue "A3" just off the press introduces to the Canadian Trade ceiling material with MACHINE-CUT BEADS and panel-plates with NAILING-FLANGES FLUSH WITH CEILING SURFACE. They make erecting 40 per cent. easier.

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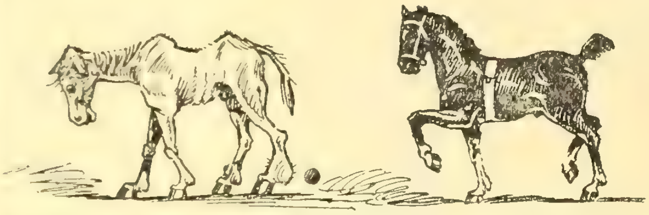

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50	Private Residences	1,023,050	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables,	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and FireHouses	208,664	28,837
656	Total 1st	12.800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
717		17,562,741	

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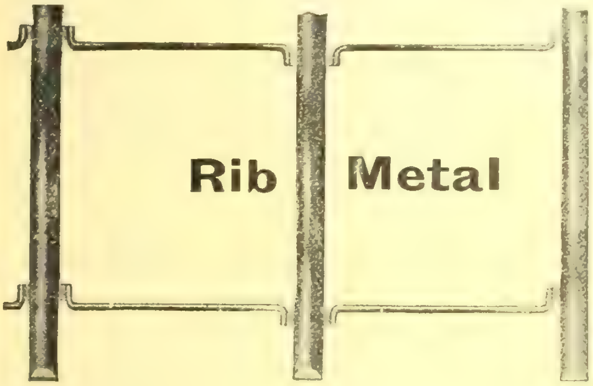

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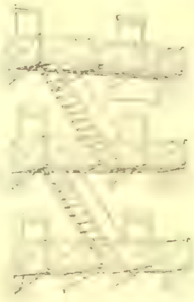
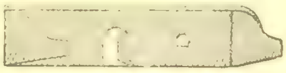
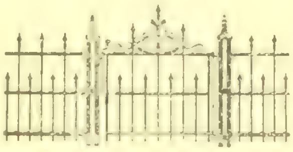


Fire Escapes

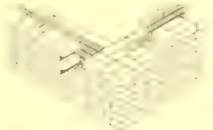
Heavy Steel Wire Doors



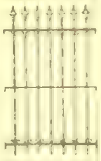
Counter and Desk Railings



Wrought Iron Fence and Gates

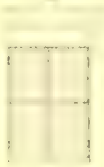


Corrugated Ties for Hollow Wall Construction

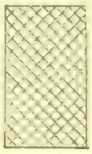


Steel Picket Doors

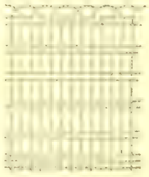
Steel Balcony Railings



Wire Window Guards



Steel Window Guards



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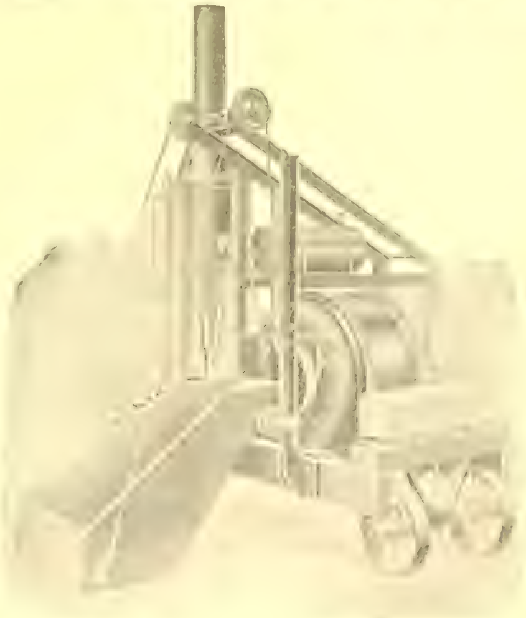

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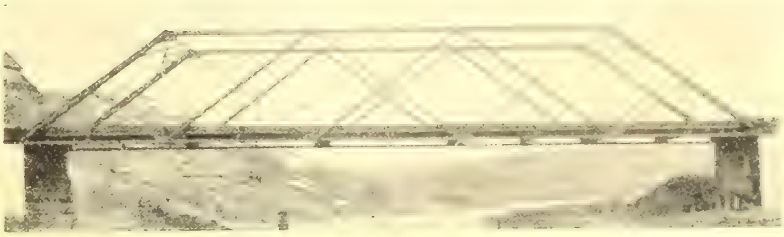

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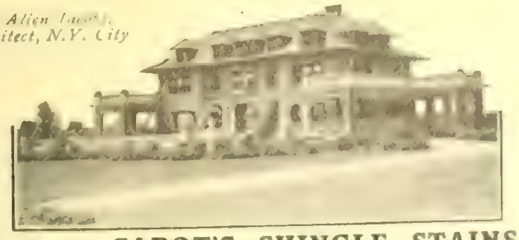

*Harry Allen Jacobs,
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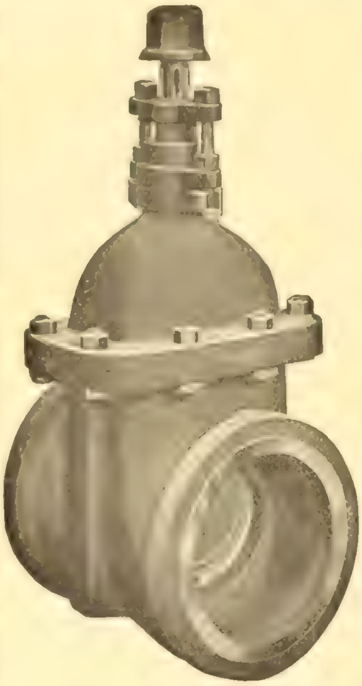

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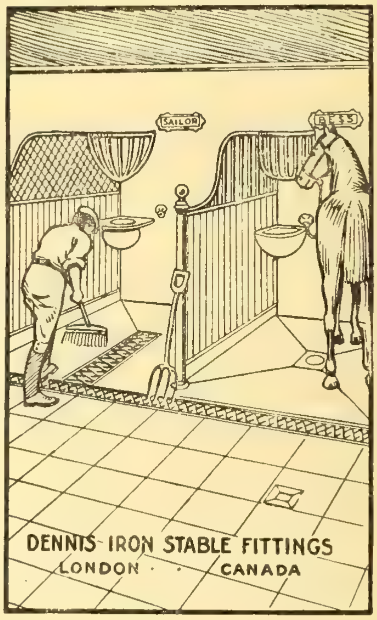

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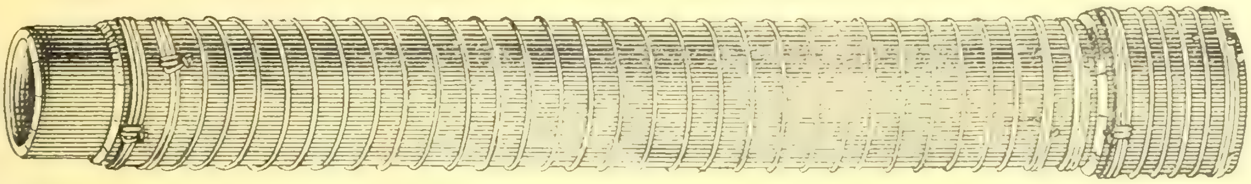

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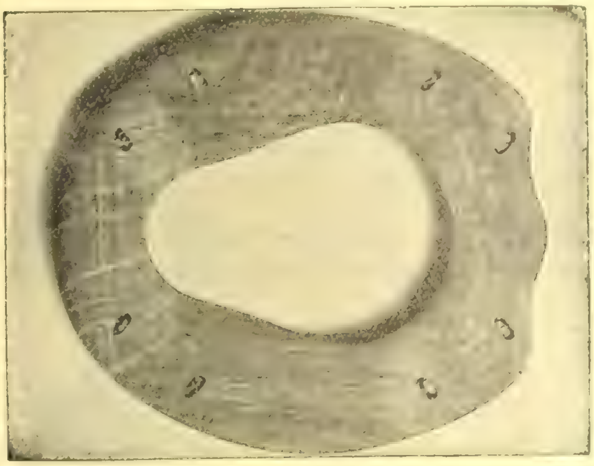

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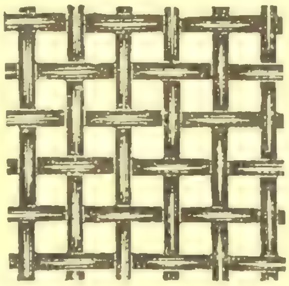

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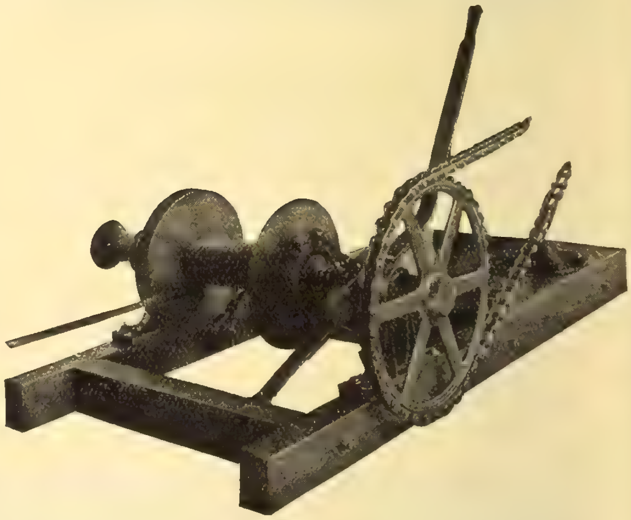

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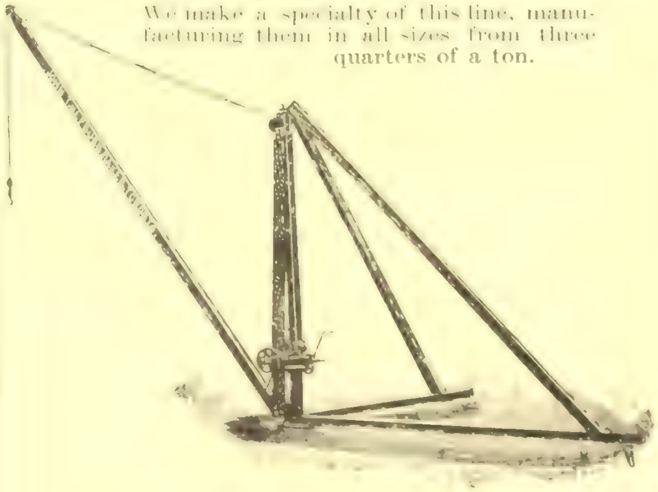

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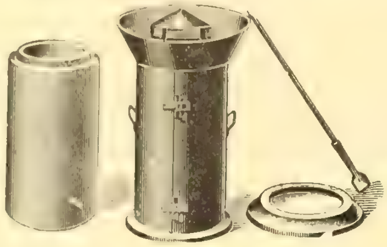

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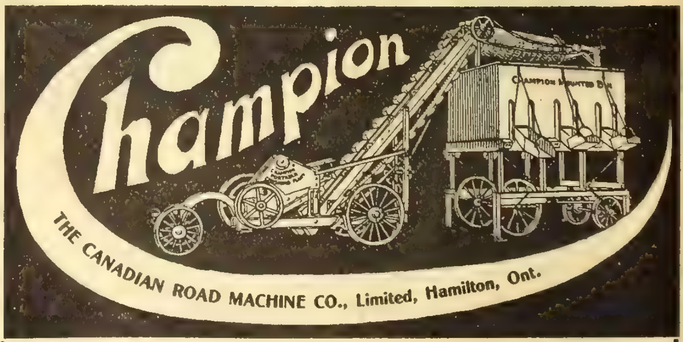
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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Aldermere, B.C.

A waterworks plant has been ordered and it is expected will be put in during the coming summer.

Boissevain, Man.

On the 14th March the ratepayers will be asked to vote on a by-law to raise $5,000 for granolithic walks.

Charlottetown, P.E.I.

The Water and Sewerage Commissioners will ask the Legislature for authority to issue debentures to the amount of $15,000 for the purchase of a new pump of the most improved type.

Fredericton, N.B.

Application will be made at the next session of the Legislative Assembly for an act authoriding this city to issue debentures for pavements to cost $30,000. J. W. McCready, city clerk.

Hull, Que.

At a meeting of the Hull Waterworks Committee, composed of Ald. Caron, Gravelle, and Mayor Fontaine, it was decided to reduce the size of the intended extension of the pump house from 40 feet by 60 feet to 40 feet square, so that the tenders may come within the amount of the appropriation for this work. The lowest tender received on the last specifications was $20,000, and the appropriation is only $16,000.

Ladner, B.C.

This municipality, south of Vancouver, is securing plans for a new water system, to cost $125,000. Springs in East Delts will be tapped and the water conveyed in wire-wound pipes throughout the municipality.

Moose Jaw, Sask.

The city engineer has been authorized to prepare specifications for paving the following: Main street as far as Ominica; River street, Tenth to Eighth; High, Tenth to Eighth; Fairford, from one block east of Main to fire hall; Ninth avenue, from River to Fairford. Estimated cost, $140,000.

Ottawa, Ont.

Tenders are being called until March 15 for the supply and delivery of waterworks fittings, etc. Newton J. Ker, city engineer. For further particulars see advertisement in this issue.

City Engineer Ker has recommended to the Water Commissioners that the Billings bridge site be secured for a reservoir, and that a water purification or filtration plant be constructed in conjunction with it; probable cost, $400,000 to $500,000.

Penticton, B.C.

This municipality is considering estimates submitted by Messrs. Kilmer & Tracy, Vancouver engineers, for a domestic water supply, as follows: From Penticton creek, $108,707; from Chute creek, $131,838; pumped from Okanagan Lake, $110,736. It is thought the amounts can be halved if the area to be supplied is judiciously planned.

Saskatoon, Sask.

Tenders addressed to J. H. Trusdale, city clerk, will be received until March 14th for furnishing the following: Cast iron pipe and specials; fire hydrants, gage valves and valve boxes; sewer pipe and junctions, and until March 21 for furnishing material for and erecting a steel stand pipe.

Toronto, Ont.

Tenders addressed to G. R. Geary, Chairman, Board of Control, will be received until March 8th for the construction of sewers on the following thoroughfares: Lane, Hugo, Follis, Mavety, Boultbee avenue, Beresford, Seymour avenue, Baxter street. Specifications at office of City Engineer.

The board has recommended that the city engineer be authorized to construct and build the foundation of the proposed electric pump building at high level pumping station.

Tenders were called for the further extension of the up-turned end of the waterworks intake pipe and recived as follows: Toronto Shipyards, $895 or $935 for quick delivery; John Inglis Company, Limited, $995; Polson Iron Works, Limited, $1,325. The contract was recommended to the Toronto Shipyards.

Woodstock, N.B.

Application will be made to the legislative assembly to authorize the borrowing of 10,000, to be expended in building permanent streets. J. C. Hartley, Town Clerk.

Winnipeg, Man.

It has been decided to call for tenders for 2,500 feet of water pipe, also for 150 valves and 50 hydrants.

AWARDED.

Saskatoon, Sask.

The following is a list of successful tenderers for suppiy of waterworks material: Sewer pipe, American Sewer Pipe Company, Akron, Ohio; water meters, Neptune Meter Company, New York; iron pipe, Jas. Robertson Company, Toronto, Ont.

Toronto, Ont.

The following contracts have been awarded by the city: Supply of cast iron pipe, 8 inch and 10 inch cast iron pipe, 8 inch and 18 inch special castings, D. Y. Stewart & Company, Glasgow, Scotland, the lowest; 10 inch special castings, Canada Foundry, the lowest. Laying outfall sewer, Miller, Cumming & Robertson, Toronto, $59,750, the lowest. Weirs, recommended [illegible] Williamson, Wellingborough, Eng., the lowest. [illegible] Company, the only tenderer. Sludge valves [illegible] London, Eng., the lowest. Cranes, Ad[illegible] the lowest. Cast iron pipes, Stavely Coal [illegible] lowest.

Winnipeg, Man.

The tender of the Robert Mitchell Company for the supply of brass goods for the waterworks department has been accepted.

Railroads, Bridges and Wharves

Brockville, Ont.

On the 14th March the freeholders of Brockville will be asked to vote for the third time on a by-law to raise $16,000 by debentures for the reconstruction of six bridges within the bounds of the corporation.

Belwood, Ont.

Tenders addressed to Thomas Goodall, township clerk, will be received until March 14th for the erection of a pile bridge across the Irvine river. Plans at office of the above mentioned.

Calgary, Alta.

Among the improvements announced by the C. P. R. for this centre are: Addition to new station building, cost $80,000; new machine shop, $20,000; freight car repair shop, coaling plant, new water services and sand tower are also included. Plans are ready for freight shed, 600 feet in length.

Goderich, Ont.

As a result of a conference between the C. P. R. and municipal representatives, the Government will be urged to complete the breakwater. That done, the C. P. R. will proceed to erect their freight sheds immediately. Mayor Cameron and Superintendent Oborne are interested.

Gaspe, Que.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, will be received until March 18th for the construction of a landing pier. Plans, etc., at office of J. G. Sing, District Engineer, Confederation Life Building, Toronto; A. R. Decary, District Engineer, Quebec; J. L. Michaud, District Engineer, Merchants Bank Building, St. James street, Montreal, and on application to the local postmaster and to the Department of Public Works, Ottawa, Ont.

North Sydney, N.S.

C. E. Bernasconi, government engineer, has been sent to conduct a survey of the ballast grounds, on which, if reports are favorable, a wharf will be built. Estimated expenditure, $50,000.

Quesnel, B.C.

[illegible] struct a bridge across the Fraser river here.

Regina, Sask.

[illegible] is to ultimately continue the line to Calgary. [illegible] the line will be built this year.

Sault Ste. Marie, Ont.

Tenders are being called until April 15 for the clearing, grading and bridge work [illegible]

[illegible] & Hudson Bay Railway between Hawk Lake Junction, A. C. R., and Hobon, C. P. R. [illegible] C. N. [illegible], chief engineer, A. C. & H. B. R., Sault Ste. Marie.

Toronto, Ont.
The residence of Sir William Mortimer Clark at Wellington street and Clarence Square has been sold to the Canadian Pacific Railway Company.

Victoria, B.C.
A local company is being formed with the purpose of arranging for additional [illegible] accommodation. After the excavating and dredging have been accomplished it is proposed to erect solid cement docking facilities. Estimated cost, $1,000,000.

Winnipeg, Man.
The Board of Control are to request the council to memorialize the Dominion Government for a wharf on the Red river. Probable cost, $[illegible].

AWARDED.

Winnipeg, Man.
Contracts for supplies for the Alberta & Great Waterways Railway totalling upwards of $[illegible] have been awarded by President W. R. Clarke, including 40,000 tons of 56-pound steel rails, to the Algoma Steel Company; bolts, the Toronto Bolt Company; spikes, the Peck Rolling Mills, Montreal; and fishplates and angle bars, the Nova Scotia Steel & Coal Company. The steel will be sufficient to cover the entire line to Fort McMurray.

Public Buildings, Churches, Schools, etc.

Brandon, Man.
According to the plans prepared by City Engineer Speakman the proposed pasteurizing plant will cost $12,000.

The executive of Brandon College have decided to raise $150,000 for the new addition. Rev. Wm. Reid, of Lethbridge, and J. Kennedy, of Winnipeg, are interested.

Chilliwack, B.C.
A new hospital will probably be erected here in the near future. L. W. Paisley is interested.

Blantyre, Ont.
Tenders will be received by Thos. Ashby until March 15th for new cement walls for a new shed at Knox Church, St. Vincent, work to be completed by July 1st.

Brockville, Ont.
Plans are being submitted for remodelling the opera house, at a cost of $22,000.

Boissevain, Man.
On March 14 the ratepayers will vote on a by-low to raise $12,000 for a new town hall.

Brantford, Ont.
A meeting of the general committee of the Brant Anti-Tuberculosis Association will be held in the City Hall on the 23rd ult., to formulate plans for building operations.

Davidson, Sask.
A money bylaw to issue $17,000 debentures for a new town and fire hall has been carried.

Fort William, Ont.
The city will be given an industrial school for boys by the Government on the condition that a site and half of the cost, $20,000, is contributed.

Gretna, Man.
U. R. Eade, architect, Union Bank Building, Winnipeg, has been instructed to prepare plans, etc., for a new public school here.

Grand Forks, B.C.
The City Clerk has been instructed to ask the Provincial Government to set about establishing an isolation hospital near here.

Halifax, N.S.
Messrs. Ross & MacFarlane, architects, Montreal, have completed plans for the new Y. M. C. A. building and tenders will shortly be received for its erection.

Hull, Que.
C. Brodeur, 141 Bridge street, school architect, is preparing plans for the new St. Jean Baptiste school. Tenders will probably be called March 8th.

Hamilton, Ont.
Tenders are being called until March 12 for the various trades required in the erection of a school at Fruitland, Saltfleet Township. Plans, etc., at office of the architects, Munro & Mead, this city.

Lindsay, Ont.
Tenders are being called for the erection of a Nurses' Residence for the Ross Memorial Hospital. For further particulars see advertisement in this issue.

Leamington, Ont.
Tenders addressed to N. Tessier, Secretary, Department of Public Works,, will be received until March 10th for heating apparatus for public buildings here. Plans, etc., on application to Mr. Samuel O. Roach, clerk of works, this place, and at the Department of Public Works, Ottawa.

Moose Jaw, Sask.
Tenders for alteration to the city hall ranged from $4,635 to $3,760. A. G. Bunyard, architect. Tenders were referred to the committee in charge.

Montreal,, Que.
Architect A. F. Dunlop expects to have a portion of the school plans, which he is preparing, far enough advanced to ask for tenders in the course of another week. Noted in issue of February 16th.

Mr. James E. Adamson has prepared plans and is receiving tenders for the erection of a new Presbyterian Church on Davard avenue, Outremont, Que.

Mr. James E. Adamson, architect, is preparing plans, etc., for the erection of a church, hall and flats on Mance street, for Mr. Cassels.

Mr. James E. Adamson, architect, Coristine Building, has completed plans for erection of large Baptist Temple and Sunday School, on Park avenue and Mance street, Montreal, for Baptist congregation. Work on Sunday School building will be commenced this spring.

A rumor is current to the effect that the civic legislators of Montreal will advise the erection of a commodious City Hall building on the present site of the Plateau Academy.

The Catholic School Commisisoners will apply to the Legislature for authority to contract a loan not exceeding $300,000 for the purpose of building schools.

North Portal, Sask.
The United States detention house and immigration hall and other buildings were destroyed by fire on the 26th ult. Total loss, $15,000.

Nelson, B.C.
The city council has adopted estimates for the year amounting to $158,600, and has decided to take up the question of a central fire hall in a new location.

New Westminster, B.C.
The site for the new Y. M. C. A. building has been chosen, and March 10th set as the date to start campaign to raise building funds ($30,000).

Oak Bay, B.C.
The Church of England will likely take definite steps towards the erection of a new church. Rev. Mr. Barton, rector.

Ottawa, Ont.
John Henderson, city clerk, has called for tenders for the carpentry work required in Howick Hall for Horse Show purposes. W. E. Joffke, architect, 26 Central Chambers.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, will be received until March 7th for restoration of and additional storey to Military Stores Building, Ottawa. Plans, etc., at this Department.

Plans for the proposed alterations to the city hall will be submitted to the Board of Control, and as soon as approved by the city council tenders will be called for.

The Public School Board endorsed raising $60,000 more debentures for the erection of Breeze Hill Avenue School and Ottawa South School, making altogether over $100,000 for the two schools which will be erected this year.

Orillia, Ont.
It is stated that construction on the new church of the Angels Guardian and on the new Methodist Sunday school will be started shortly. New tenders for the proposed public library will be called for as soon as the Library Board has secured plans in accordance with Mr. Carnegie's requirements.

Portage la Prairie, Man.
On March 22 a by-law to raise $22,000 for a new school in the north ward will be voted on.

It is proposed to erect a Y. M. C. A. building in this city. Ald. J. J. Garland, E. A. McPherson and E. W. Thompson, of Regina, are interested.

The building of a new church for St. Cuthbert R. C. congregation is being considered. Estimated cost, $20,000 to $25,000. Probable site, Campbell street.

Rodney, Ont.
The proposition to build a joint municipal building has been endorsed by the ratepayers. Building committee: Reeve McLean, Deputy Reeve Campbell, and others.

Starbuck, Man.
Tenders will be received until March 11th by Robt. Houston, secretary-treasurer, for all trades, except excavation, for the erection of a brick school building. E. D. Tuttle, Winnipeg, architect.

Saskatoon, Sask.
The University of Saskatchewan are calling for tenders until March 21st for the different buildings. For further information see advertisement in this issue.

Strathcona, Alta.
The University Senate has approved of plans for the Methodist college to be erected this year to cost $100,000.

Toronto, Ont.
The Government has bought the site on Bloor street east from the Board of Education for $90,000. It is understood that the new Government House will be erected there.

The new University Y. M. C. A. will be situated on the southeast corner of Hoskin avenue and St. George street. Of the $75,000 and more required for it, the students have raised over $16,000.

At the annual meeting of the local branch of the Victorian Order of Nurses, the need of a new home was emphasized by the speakers, Lieut.-Governor Gibson, Mr. D. R. Wilkie, and Mayor Geary.

The following building estimates have been prepared by the Board of Education: Technical School, $100,000; Oakwood High School, $150,000; Manning Avenue School, $90,000; Frankland School, $60,000; additional to Humberside Avenue High School, $40,000; additions to Public Schools, $300,000. Total, $740,000.

A new cottage is needed at the Victoria Industrial School, and the Board of Management have decided to ask the Ontario Government for a loan of $25,000.

Victoria, B.C.

The Alexandra Club of this city has decided to buy a central site and erect a handsome modern steel and concrete club home to cost approximately $75,000. The building will be of either three of four storeys. Mr. H. Croft, president.

Vancouver, B.C.

The First Presbyterian Church, now occupying the corner of Hastings street east and Gore avenue, has secured a new site on the northeast corner of Pender and Dunlevy avenue. No details have yet been settled as to the date of building. Rev. Dr. Fraser, the pastor, will return from Honolulu on March 10th.

The plans drawn up by Bryon & Waterson for the new club house for the Royal Vancouver Yacht Club have been approved and tenders recommended for acceptance, cost $5,000. Noted in issue of January 5th.

Winnipeg, Man.

C. P. Walker, of the Walker Theatre, has purchased the Winnipeg Theatre for $120,000, and will erect modern theatres here, at Fort William and Saskatoon.

Manitoba's legislative buildings will be reconstructed at a cost of $400,000.

A permit has been issued to the Dominion Government for interior alterations to the old post office building at a cost of $42,000.

Yorkton, Sask.

Tenders addressed to W. E. Pinkerton, secretary-treasurer, Yorkton Collegiate Institute, will be received until March 15th for the several trades required for the construction of a collegiate institute. Plans at office of the Builders' Exchange, Winnipeg, or at office of W. W. LaChance, architect, Saskatoon, Sask.

AWARDED.

North Sydney, N.S.

Wm. F. Kiely, parish priest, writes that the contract for the church on Archibald street, has been awarded to Michael McMillan, of this town, at $18,397. Rhodes, Curry & Company, of Sydney, tendered at $18,900.

Victoria, B.C.

The Department of Public Works has awarded the contract for an eight-room school house to A. J. Prudhomme at $[illegible],000.

M. M. Heavens & Son, hardware, Welwyn, Sask., have dissolved.

Blue & Deschamps, saw mill proprietors, Rossland, B.C., have dissolved.

Independent Shingle Company, Limited, New Westminster, B.C., have [illegible]

Residences

Montreal, Que.

Mr. Joseph Perrault, architect, 2106 Park avenue, has completed plans for St. George's Apartments to be erected at the corner of Park and Fairmount avenue. Tenders close at his office on March 5th.

Hutchison, Wood & Miller, architects, Royal Insurance Building, have prepared plans for a residence to be erected for Dr. H. M. Church at the corner of St. Antoine and Mount Stephen streets, Westmount.

Tenders will be received until March 4 for the erection of flats and stores for Mr. Wilfrid Bessette. Alphone Venne, architect, 15 St. Lawrence Boulevard.

Saxe & Archibald, architects, 59 Beaver Hall Hill, are preparing plans for a residence to be erected on Ontario avenue for Mr. J. M. Wilson.

Mr. Alphone Venne, architect, 15 St. Lawrence Boulevard, is preparing plans and specifications for a residence for Notary Hetu, Ville Emard. Tenders will be received until March 15th.

Tenders have been received by Hutchison, Wood & Miller, architects, Royal Insurance Building, for the erection of a residence at Hudson Heights, for Mr. J. W. Pike; the contract will shortly be awarded.

Tenders have been received for the construction of a residence on St. Luke street for Mr. A. J. Darling. J. Rawson & Gardner.

Tenders close March 3rd for the erection of two flats on Westmount Plateau for U. Beaupre & Sons. MacDuff & Lemieux, architects, 212 Merchants Bank Building.

Tenders are being received for the erection of a residence on Westmount Boulevard for Mr. Walter J. Sadler. Mr. James E. Adamson, Coristine Building, architect.

Mr. James E. Adamson, architect, is preparing plans for a residence for Mr. Ernest Latter to be erected in Westmount, and tenders will shortly be called.

Plans are being prepared for two houses to be erected on St. Catherine road, Outremont, for Donald Munro, Esq. Tenders will be called for about end of March. Mr. Jas. E. Adamson, architect, Coristine Building.

Plans have been prepared for erection of semi-detached villas on Rockland avenue, Outremont, for J. F. McLean, Esq. Mr. Jas. E. Adamson, architect, Coristine Building.

Welland, Ont.

As soon as the weather opens up Contractor Oliver will commence the erection of four or five houses on Regent street. He may also put up a store there.

AWARDED.

Montreal, Que.

[illegible] Cedar avenue for Mr. J. Eard Birks. Geo. J. Hyde, architect, 157 St. James street.

Mr. Walter Livermore, 72 Anderson [illegible] pentry, J. & W. Morrison; roofing, Camp[illegible]

Business Buildings and Industrial Plants

Bowmanville, Ont.

It is announced that a Canadian Goodyear Tire & Rubber Company has been formed, and that the factory will be located here. Branches will be opened in important centres, that in Toronto being at 85-87 Queen street east. Mr. F. Hodgins, local manager.

Bridgeburg, Ont.

Mr. C. W. Vahey, of the Board of Trade, is authority for the statement that the Lantz Company, of Buffalo, manufacturers of interior furnishings, have decided to locate here, probably at Amigari.

Brockville, Ont.

The Ottawa Vacuum Cleaner Company has written to the council making enquiries regarding facilities, etc., towards locating here.

Cobalt, Ont.

The building occupied by Frank Smithers was destroyed by fire on the 22nd ult. Loss, $3,000.

Chatham, Ont.

It is stated that the Dowsley Spring & Axle Company's plant will be extended this year. Proposed expenditure, $15,000. W. T. Sampson, manager—also of Gananoque Carriage Company.

Hamilton, Ont.

The Tuckett's Cigar Company and Baynes Carriage Company are contemplating building big additions to their factories.

Hazelton, B.C.

The leading hotel here was destroyed by fire on the 24th ult. Estimated loss, $15,000.

Iroquois, Ont.

Two buildings owned by Mrs. Serviss were destroyed by fire on the 22nd ult., also other buildings gutted. Estimated total loss, $10,000.

Kamloops, B.C.

Mr. Dalton, architect, 615 Hastings street, Vancouver, is preparing plans for the erection of the Imperial Bank branch here on the corner of Victoria street and Second avenue.

London, Ont.

The council may take up later the proposal of the Board of Trade to provide a site for union station for traction lines by disposing of the present city hall.

It was suggested at the Board of Trade that a joint stock company be formed to purchase land outside of the city as factory sites to induce manufacturers to locate here. Mr. T. B. Escott, 146 York street, is interested.

Murray Bay, Que.

The planing mill and residence of Treffle Pergeron were destroyed by fire on the 20th ult. Total estimated loss, $70,000. Mill and residence will be built at once.

Montreal, Que.

[illegible] new Windsor street station viaduct. W. C. Painter, architects, C. P. R. Windsor street station.

[illegible]

[illegible]

[illegible] the premises which they at present occupy and will make alterations to [illegible] property. Hogle & Davis, architects, 80 St. Francois Xavier street, have the work in charge.

The warehouse of the Montreal Cotton & Wool Waste Company, 151-159 Common street, was damaged by fire on the 24th ult. Estimated loss, $7,000.

The Lowney Company of Canada, Limited, have under consideration the erection of a factory building that will double their present capacity. Sketches have been prepared by Messrs. Hutchison, Wood & Miller, and it is expected that this work will be proceeded with in the spring.

Mr. James E. Adamson, architect, Coristine Building, is preparing plans for a factory building to be erected near Aqueduct street.

Plans for the Willis Building to be erected at the corner of Drummond and St. Catherine streets, will be completed in about five weeks. Messrs. Ross & MacFarlane, architects, 1 Belmont street.

The National Trust Company is said to have under consideration the erection of a modern hotel on the present site of the Protestant school on Peel street, upon which property they are reported to have secured an option.

The Crescent Manufacturing Company will also extend their factory premises, and Messrs. Findley & Spence are preparing plans for a new structure to be erected close to their present office at the corner of William and Inspector streets.

New Westminster, B.C.

The Great Northern intend to erect a new depot here, also to extend their ferry wharf.

Orillia, Ont.

The E. Long Manufacturing Company are planning the completion of their new factory in Simcoe avenue.

Ottawa, Ont.

It is announced that Mr. George Bryson, has bought the Crown hotel, which will probably be improved.

Mr. Max Werner, George street, is having the store at the corner of Sussex and George streets remodelled as an up-todate hotel.

The Crown Hotel property, on the corner of Bank and Sparks streets, was damaged by fire on the 24th ult. Loss, about $2,000.

The Shepard & Morse Lumber Company are installing two double cut band mills in preparation for enlarged operations next summer.

Portage la Prairie, Man.

The Rogers Wholesale Fruit Company, it is understood, are negotiating in regard to a building site for a branch warehouse here.

Prince Rupert, B.C.

A company is seeking a charter to operate a smelter and gas plant here. That granted, construction will immediately start. Major Nicholls, Victoria, is interested; Mr. Walters, company's engineer. Noted in last issue.

Quebec, Que.

The Bank or Quebec will open a branch here in temporary offices. A local realty firm are looking for a suitable site for a permanent office.

The saw mill of J. H. Gignac & Company was damaged to the extent of about $70,000 on the 25th ulto.

Sydney, N.S.

Mr. M. F. Derrick, late of Glasgow, Scotland, is the practical man in connection with the construction and operation of the National Rolling Mills. Noted in issue of January 12th.

Saskatoon, Sask.

W. W. LaChance has plans prepared for the new Ferguson block which will be erected this summer. Plans call for three storeys, full basement, frontage 50 feet, depth 90 feet; cream terra cotta will be used in the front.

Swan River, Man.

P. McKay's general store and a milliner store were destroyed by fire on the 19th ult. Estimated total loss, $29,000.

Summerland, B.C.

It is announced that the C. P. R. will begin construction of its new wharf and warehouse shortly. Expenditure, $50,000.

Tatamagouche, N.S.

There is a movement on foot among the residents here to establish a fine summer hotel on Campbell's Hill.

Truro, N.S.

It is understood that Mr. Doungall Henderson has charge of the work in connection with the Lewis factory on the Railway esplanade.

Toronto, Ont.

The premises of the Art Wall Paper Shop, Limited, were badly damaged on the 22nd ult. Loss to building, $4,000. Ryrie Bros. also lost $2,000 on building.

Mr. George Weston has purchased the northwest corner of Richmond and Peter streets, where a 4 storey biscuit bakery will be built.

The building occupied by Green & Company, 25 Front street east, was damaged by fire on the 24th ult. Estimated damage to building, owned by Toronto General Trusts Corporation, $2,500.

Victoria, B. C.

The Canadian Bank of Commerce have purchased a building site on the corner of Bay and Douglas streets. It is expeected that the branch will be erected by midsummer.

It is reported that Mackenzie & Mann are acquiring a site at the Esquimalt harbor and iron properties on the island, with the idea of establishing steel works. In this connection H. F. Bullen, of Bullen Bros., proprietors of the Marine Railway Company, Esquimalt, is now in Ottawa.

Vancouver, B.C.

John Hanbury, of Brandon, who has mills at Cranbrook and Elko, will rebuild at a cost of $25,000 his mill on False creek, which was burned down two years ago.

Winnipeg, Man.

J. McDiarmid Company, Limited, have a permit for the erection of the office on Donald street at the end of Princess street for $80,000. Work will be rushed.

The Federal Investment Company have purchased the corner of Notre Dame street and Albert, on which, it is stated, in all probability a costly building will be erected.

Buildings forecasts are as follows: Veterinary hospital on James street, cost $17,000; W. W. Blair is completing plans for the Farmer block on Portage avenue, cost $70,000, to be erected this spring, also plans for number of residences; Cadham & Crayston have completed plans for a $60,000 business block to be erected in Calgary; James Chisholm has rough plans for four large blocks; V. W. Horwood has plans drawn for two blocks to be erected here this summer.

The premises of T. D. Deegan, 556 Main street, were damaged to the extent of about $8,000 on the 23rd ulto.

Tenders are being called until March 5 for the different trades for the erection of a brick building containing six stores. Plans at 602 Ellice avenue.

AWARDED.

Goderich, Ont.

The contract for the concrete annex to the Goderich Elevator & Transit Company's plant, has been awarded to J. H. Tromanhauser, Temple Building, Toronto. Work will be started immediately.

Montreal, Que.

Contracts for the erection of a seven storey building for the St. Lawrence Sugar Refining Company, Limited, have been awarded as follows: Steel erection, Dominion Bridge Company, Lachine. Further contracts have not yet been awarded.

F. & W. S. Maxwell are the successful competitors among the six architects who submitted plans for the 10 storey office building for the C. P. R. on St. James street.

E. G. M. Cape has been awarded the general contract for the erection of the Beardmore Building, at the corner of Lemoine and St. Peter strets. H. C. Stone, architect, 84 St. Francois Xavier street.

Winnipeg, Man.

The contract has been let to Phillip Burns by the Paulin-Chambers Company for their building. Work will start at once. Cost, $31,000. Frank R. Evans, architect.

Power Plants, Electricity and Telephones

Camrose, Alta.

This municipality is open until April 16 to receive propositions from companies or individuals for the installation of an electric light and power plant on a ten-year franchise basis. O. B. Olson, secretary-treasurer.

Calgary, Alta.

The Calgary Water Power Company have placed an order with the Robb Engineering Company, of Amherst, N.S., for a 1,000 horse-power vertical cross compound condensing engine complete with condenser, heater and pump. They have also placed an order with the Canadian Westinghouse Company, of Hamilton, Ont., for a 600 kw. alternating current generator, complete with exciter and switchboard.

Guelph, Ont.

A preliminary survey of the proposed People's Railway between Hespeler and here, with a branch to Puslinch Lake, has been made by Engineer Warfield.

Hamilton, Ont.

The Hamilton, Waterloo & Guelph Railway have placed an order for ties and rails for the construction of the road to Galt.

The Dominion Power & Transmission Company, Limited, have placed an order for 30 cars of cedar ties with the Long Lumber Company of this city.

Moose Jaw, Sask.

Steps are now being taken for the organization of a local corporation to negotiate with the city council for a street railway franchise.

Montreal, Que.

Tenders have been called for the electric lighting by arc lamps, style "magnetite" (last model), of 1200 to 1500 candle power, the contract to be for one hundred lamps, with privilege for the town to increase that number. M. G. Ecrement, secretary-treasurer, town of Maisonneuve.

The Railway Committee has passed the Montreal Central Terminal bill with the elimination of clauses authorizing the acquisition of lighting and power companies.

A company with twenty million dollars capital has been organided under the name of the Montreal Elevated & Underground Railway Company, to build elevated and underground railways in the city and Island of Montreal.

Ottawa, Ont.

The city engineer's department has completed the surveys and levels for the proposed subway and overhead bridge in the neighborhood of Concord street and Hawthorne avenue for the proposed extension of the street railway line to Ottawa East. Plans and estimates will be ready at an early date for submission to the street railway extension committee.

The City of Ottawa municipal electric department has called for tenders on meters, transformers, incandescent and arc lamps, wire, globes, carbons, hardware and sundry supplies. J. E. Brown, Superintendent.

Orangeville, Ont.

The Dufferin Light & Power Company, Limited, (T. R. Huxtable, manager), has purchased the Shelburne and Orangeville lighting plants and a water power at Horning's Mills capable of developing 1,000 h.p., which it intends developing the coming summer.

Parry Sound, Ont.

It is proposed to install at the municipal electric light plant a series street lighting system; it is also proposed to put the whole system on meters this year. G. Groves, Superintendent.

Regina, Sask.

Tenders addressed to S. O. Porter, Deputy Minister, Department of Railways and Telephones, will be received until March 10th for telephone supplies. Information obtained on application to the Department.

Summerside, P.E.I.

A new street lighting contract has been made between this town and the Sun Electric Company to install twenty 80-candle power and forty-six 32 candle power tungsten lamps, with all modern equipment, at an estimated cost of $1,500.

Saskatoon, Sask.

The council have appointed a special committee to arrange terms with the Saskatoon Power Company.

Sydney, N.S.

The recommendation of the Board of Works to grant permission to the Dominion Railway and Plaster Company to build and operate a tramway on certain streets of this city was adopted by the council, with certain provisions.

St. Mary's, N.B.

The Fredericton Street Railway Company is said to be considering a plan to construct an electric railway, which will connect St. Mary's, Gibson, Maryville and Nashwaaksis on one side of the river and Springhill and Victoria Mill on the other side.

Toronto, Ont.

The Toronto Railway Company are prepared to go on with the work of extending the street car service north into Rosedale. The company will commence the work immediately if an understanding can be reached with the city whereby the extension can be made upon the same terms as the Avenue road extension.

Victoria, B.C.

The necessity of enlarging the city's electrical plant to permit of increased service in street lighting is a topic which will soon be considered by the electric light committee.

Waterford, Ont.

Tenders will be received until March 8th by James Ross, village clerk, for lighting the streets of this municipality.

Winnipeg, Man.

It has been decided to erect a wireless station here.

The Board of Control will shortly call for tenders for the equipment of their terminal power station.

AWARDED.

St. Thomas, Ont.

The City Council has awarded the contracts for installing the Niagara power to the Westinghouse Company, of Hamilton. The company will install the machinery in five months' time for the sum of $18,000.

Saskatoon, Sask.

J. H. Trusdale, city clerk, has sent the following list of successful tenderers for the electrical supplies required by the city of Saskatoon: Electric light meters, Packard Electric Company, Toronto, Ont.; electric light meters, Canadian General Electric Company, Toronto; copper wire, Canadian General Electric Company, Toronto; transformers, Packard Electric Company, Toronto, Ont.; electric supplies, Northern Electric & Manufacturing Company, Toronto.

Miscellaneous

Fort William, Ont.

This city is calling for tenders for gas franchise until April 1st. For further particulars see advertisement in this issue.

Guelph, Ont.

In the report of the Government Commission a new dairy stable is recommended for the Agricultural College here.

Moose Jaw, Sask.

Tenders for stone crusher and street sprinkler have been received. For the latter, prices ranged from $500 to $5,200, which latter was for motor sprinklers; for the former, $275 to $530. Tenders were referred to committees in charge.

Montreal, Que.

The construction of an elevated boulevard and drive on the south shore of the St. Lawrence river, from Lamberts, Que., to La Prairie, P.W., is contemplated. Estimated cost, $175,000. Geo. A. Simard, manager Franco-American Chemical Company, [illegible]

Recent building permits include: G. De- [illegible] dwellings, $2,800; J. Dorion, 838 DeGaspe, house containing two dwellings, $2,000; J. [illegible] store and dwelling, $2,500.

Ottawa, Ont.

Tenders are being called until March 15th by the city for civic supplies, broken stone, brick, etc. For further particulars see advertisement in this issue.

The report of the engineers of the Public Works Department with reference to the dredging of the Riviere des Prairies (Back River) at Montreal, places the cost of dredging a five-foot channel at $63,849. The principal items are: dredging from Lake of Two Mountains to Cartierville, $7,000; Bordeaux to Ile Visitation, $32,000; Ile Visitation to the rapids opposite the Village of Riviere des Prairies, $22,221, and head of rapids to Bout de l'Ile, $1,050.

Recent building permits include: James Davidson, brick veneer apartment house, Albert street, $6,000; Jas. More and Isaac Cowie, brick veneer dwelling, Centre street, $3,000; John E. Wilson, brick veneer dwelling, Spadina avenue, $2,000; T. J. Somerville, two detached brick veneer dwellings, Spadina avenue, $3,000; David Beggs, brick veneer dwelling, Florence street, $2,500; H. A. Leach, brick veneer dwelling, Thornton avenue, $2,200; S. Miller and D. E. Eptsein, brick addition to shops and dwelling, Elgin street, $5,000.

South March, Ont.

Tenders will be received until March 15 for dredging work on the Carp river. For further particulars see advertisement in this issue.

Victoria, B.C.

Recent building permits include: Mark Cozner, dwelling on Leighton road, $2,000; W. J. Gilliland, dwelling, Pembroke street, $2,300; H. W. Davies, apartment block at the corner of Johnson and Quandra streets, $6,000; John Valo, combined store and dwelling at Bay and Government streets, $4,000.

A $13,000 brick block to be used as a carriage house and stable will be erected on Johnson street by Dr. Gareeshe. Brick and concrete will be the materials used. G. C. Mesher & Company, architects.

Winnipeg, Man.

At the request of Alloway & Champion, the Board of Control have decided to extend the time for receiving tenders for asphalt to March 10.

AWARDED.

London, Ont.

The contract was awarded to the Cleveland Rubber Company, the lowest tenderers, for the supply of 2,000 feet of hose at 97 cents per foot. Other tenders were as follows: Gutta Percha Rubber Company, Dunlop Rubber Company, Canada Rubber, a New York rubber company and an English firm. The purchase of 600 feet of [illegible] a foot from the Gutta Percha Rubber Company was recommended.

Victoria, B.C.

[illegible] the fire wardens were as follows: Hydrants—Hutchinson Bros. at $44 each and [illegible] $12.40 per cwt. and the Hinton Electric [illegible] alarm system, 250 fittings and 375 brackets. W. Grimm & Sons, Robertson Iron [illegible] chinery Depot. The fire chief will decide which is the lowest tenderer.

Tenders and For Sale Department

County of Elgin

Tenders for Bridges

[illegible] addressed to the undersigned [illegible] SATURDAY, MARCH [illegible] construction of Reinforced [illegible] feet span of a [illegible] Sidewalk, to be built over [illegible] Arch Bridge to be built [illegible] Lynhurst, adjoining St. [illegible] specifications may be seen at [illegible] forms of tender obtained.

[illegible] reserve the right to reject any or all tenders.

JAS. A. BELL,
County Engineer.

[illegible] 21, 1910. 9

Tenders For

Gas Franchise

[illegible] sealed and endorsed "Gas Franchise," will be received by the City Clerk of the Corporation of the City of Fort William, up to APRIL 1ST, 1910, for the letting of a Gas Franchise, including construction of Plant, Mains, etc., and operation.

Conditions, specifications and form of tender, on which bids must be submitted, can be obtained from the undersigned.

JOHN WILSON,
Assistant City Engineer,
[illegible] Fort Wililam, Ont.

Notice to Contractors

Civic Supplies

[illegible] addressed to the Chairman of the Board of Control, City Hall, Ottawa, will be received by registered post only, up to 12 o'clock noon, TUESDAY, MARCH 15, 1910, endorsed tender for Broken Stone, Brick, Stone Curb, Stone Setts, Cement, Plank and Cedar, Sand, Vitrified Clay Pipe and Asphalt, as the case may [illegible]

Specifications, form of tender and full particulars may be obtained on application to the City Engineer's Office, City Hall.

The Corporation does not bind itself to accept the lowest or any tender.

NEWTON J. KER,
City Engineer.

Ottawa, February 23, 1910. 9

Notice to Contractors

Water Works Supplies

Sealed tenders addressed to the Chairman of the Water Works Committee, City Hall, will be received by registered post only, up to 5 p.m., TUESDAY, MARCH 15, for the supply and delivery of Brasswork, Castings, Cast Iron Pipe, Hydrants and Valves, Lead Pipe and Pig Lead, Oils and Greases, required by the Water Works Department.

Specifications, form of tender and full particulars may be obtained on application to the City Engineer's Office, City Hall.

The Corporation does not bind itself to accept the lowest or any tender.

NEWTON J. KER,
City Engineer.

Ottawa, February 23, 1910. 9

Factory for Sale, Rent or Exchange

1 storey, light, three-sides, 3,500 square feet floor space. Prominent corner on Queen Street, five minutes from Yonge Street, Toronto. Address Box 920, "Contract Record," Toronto. 9

For Sale

A 15 Ton Marion Steam Shovel in good state of repair. Apply to GEORGE A. BEGY, St. Catharines, Ont. 9

Plant for Sale

For Sale:—The following Second-Hand Plant, located at Durham, Ont., or portion theerof. The whole lot at a reduced price,

25 No. 3 American, square pan, wooden hub, Wheel Scrapers.

28 No. 3 K. & J., round pan, iron hub, Wheel Scrapers.

6 No. 3 Western, square pan, with doors, Wheel Scrapers.

7 No. 2, K &J, round pan, iron hub improved, Wheel Scrapers.

55 Doors and Gates, for No. 3 Wheel Scrapers.

27 Slush Scrapers.

15 Light and Heavy Plows.

Located at Three Rivers, Que.

One Large Travelling Clam Shell Derrick.

One Steam Pile Hammer (Cram Patent), with Steam Hose.

One Thomas Automobile (Model 31), 60 h.p., thoroughly overhauled and painted; location, Toronto.

THE RANDOLPH MACDONALD CO., LIMITED,
14 Crown Life Building, Toronto, Ont.

TENDERS

University of Saskatchewan

Sealed tenders, addressed to the undersigned, will be received not later than the 21ST DAY OF MARCH, 1910, for the different trades required in the erection of the College Building, Students' Residence, Power House, Live Stock Pavilion, Agricultural Engineering Building, on the University Grounds in Saskatoon.

The right to reject any or all tenders and to waive any defects or irregularities therein, is to be at the discretion of the Board of Governors.

Tenders are to be made on forms furnished by the architects.

Each tenderer is to enclose with his bid an accepted cheque for 10 per cent. of the amount of his tender, which deposit will be forfeited if the tenderer fails to execute the contract and bond when requested, and will be returned to the unsuccessful bidders when the contract is signed.

Plans and specifications may be seen at the office of the University, Saskatoon, Sask., or at the office of the Architects, David R. Brown and Hugh Vallance, Canada Life Building, Montreal, Que., and at the rooms of the Builders' Exchange, Winnipeg, Man,

WALTER C. MURRAY,
President.

Saskatoon, Sask., February 21st, 1910. 11

Tenders For

Nurses' Residence

Tenders marked "Tender," will be received by the undersigned until MARCH 10, 1910, for the whole or separate trades required in the erection of a Nurses' Residence for The Ross Memorial Hospital, Lindsay. Plans may be seen and copies of specifications obtained at the office of The Flavelle Milling Co., Lindsay. No tender necessarily accepted.

J. D. FLAVELLE,
Lindsay. 9

Tenders for Dredging

Sealed tenders addressed to Thomas Richardson, Clerk of the Township of March, South March, Ont., will be received up to 12 o'clock noon of the 15TH DAY OF MARCH, 1910, for Dredging Work on the Carp River within the Townships of March and Huntley, in the County of Carleton, to be done in accordance with the report, plans, profiles, specifications and estimates of J. H. Moore, C.E., filed with the Township of March, on the Carp River, Drainage Improvement Scheme. Tenders must be accompanied by a marked cheque for $1,000.00, payable to the Treasurer of the Township of March. The above plans, profiles, specifications, etc, may be inspected and full particulars and form of tender obtained from J. H. Moore, C.E., Smith's Falls, Ont., or from the Township Clerk, South March, or at the office of Messrs. Beaument & Armstrong, 25 Sparks Street, Ottawa.

The lowest or any tender received not necessarily accepted.

THOMAS RICHARDSON,
Clerk.
10 South March, Ont.

Position Vacant

WANTED.—TWO DRAUGHTSMEN to work in a Toronto architect's office. State experience and salary expected. Apply Box 933 "Contract Record."

Business Notes

Ricard & Lalonde, electricians, Montreal, have dissolved.

Walter Ryan & Company, contractors, Montreal, Que., have dissolved.

Dunn Bros., builders' supplies, Winnipeg, Man., have dissolved partnership.

Walter Walker, dealer in cement blocks, Gilbert Plains, Man., it is stated, has assigned.

A winding-up order has been given in the Barron Brick Company, Limited, Weston, Ont.

W. L. Martin, lumber dealer, Wapella, Sask., has been succeeded by Corona Lumber Company.

Jos. Martial, Son & S. Johnston, bricklayer contractors, Montreal, Que., have dissolved partnership.

The B. C. Gazette gives notice of the incorporation of the following companies:—Manquam Falls Power Company, Limited, capital $100,000; the Standard Hardware Company, Limited, capital $30,000; International Electric Company, Limited, capital $1,000,000.

We Have Always in Stock:
at all our yards

Crushed Stone

and

Crushed Granite

For Fireproof, Sidewalk or Road Construction

Cement Building Stone Builders' Supplies

C.P.R., Grand Trunk, M.C.R. and T.H. & B. Railway Delivery.

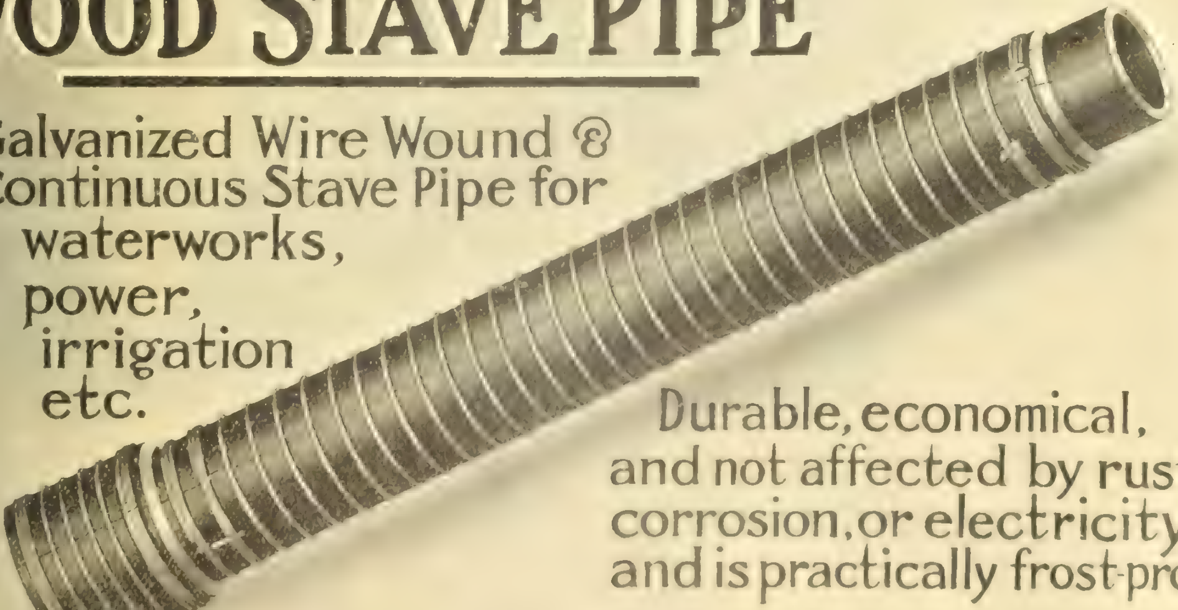
ROGERS SUPPLY COMPANY

Head Office: 3 King Street East, Toronto
Phone Main 4155

YARDS;	Foot of Berkeley St.	Foot of Church St.	C.P.R. Crossing North Toronto
	Foot of Bathurst St.	256 Lansdowne Ave.	G.T.R. Crossing Pape Ave.

WOOD STAVE PIPE

Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.

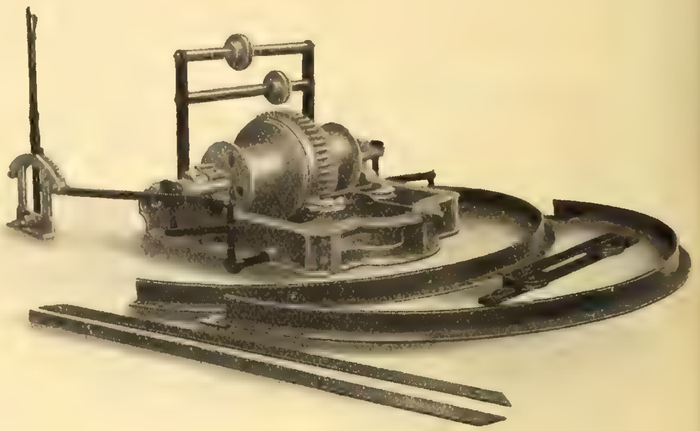


Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

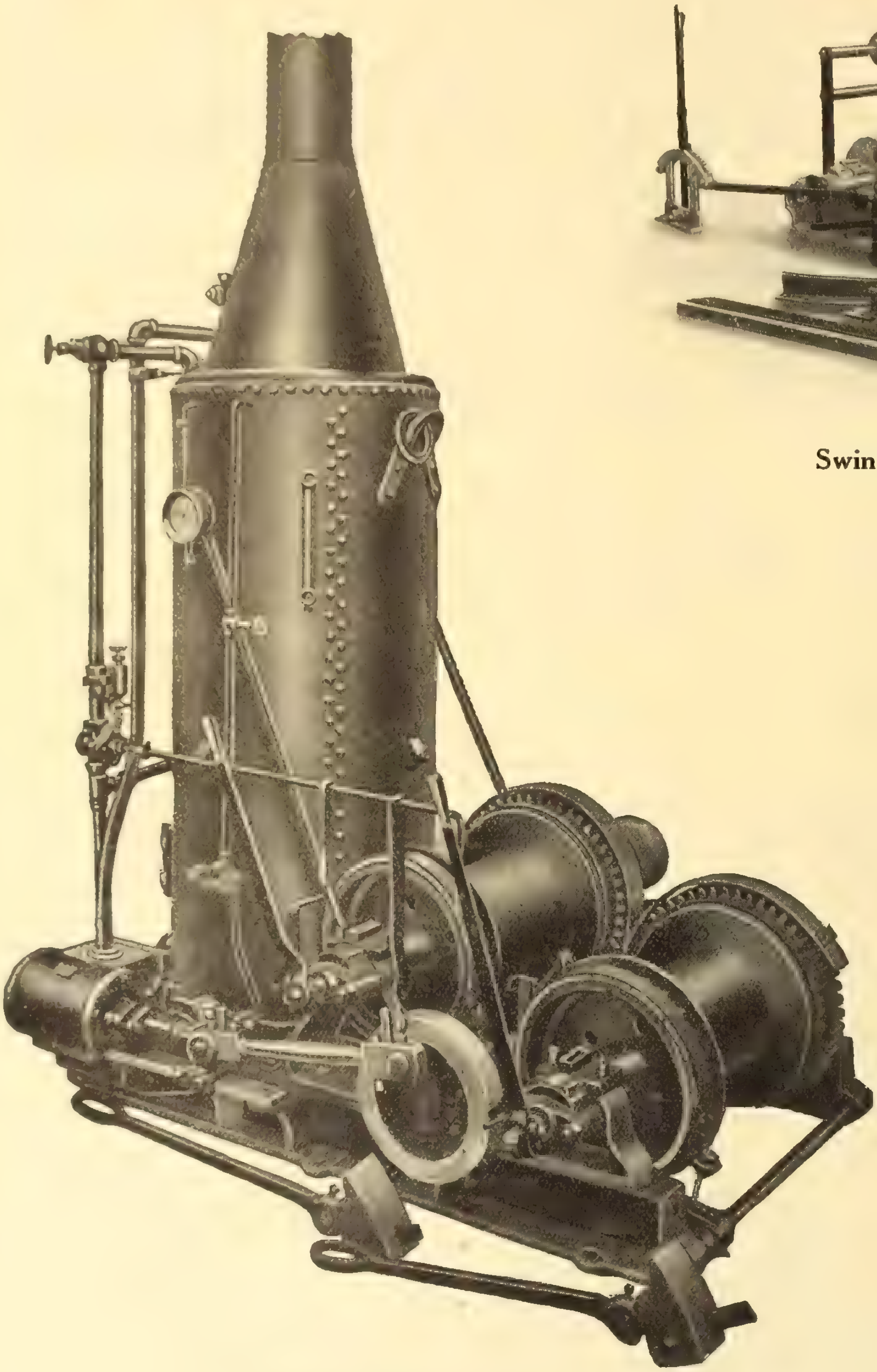
Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited

New Westminster, B.C.



Swinger and attachments.



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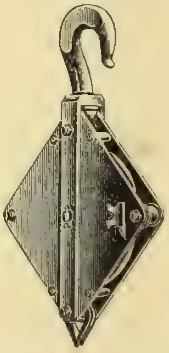

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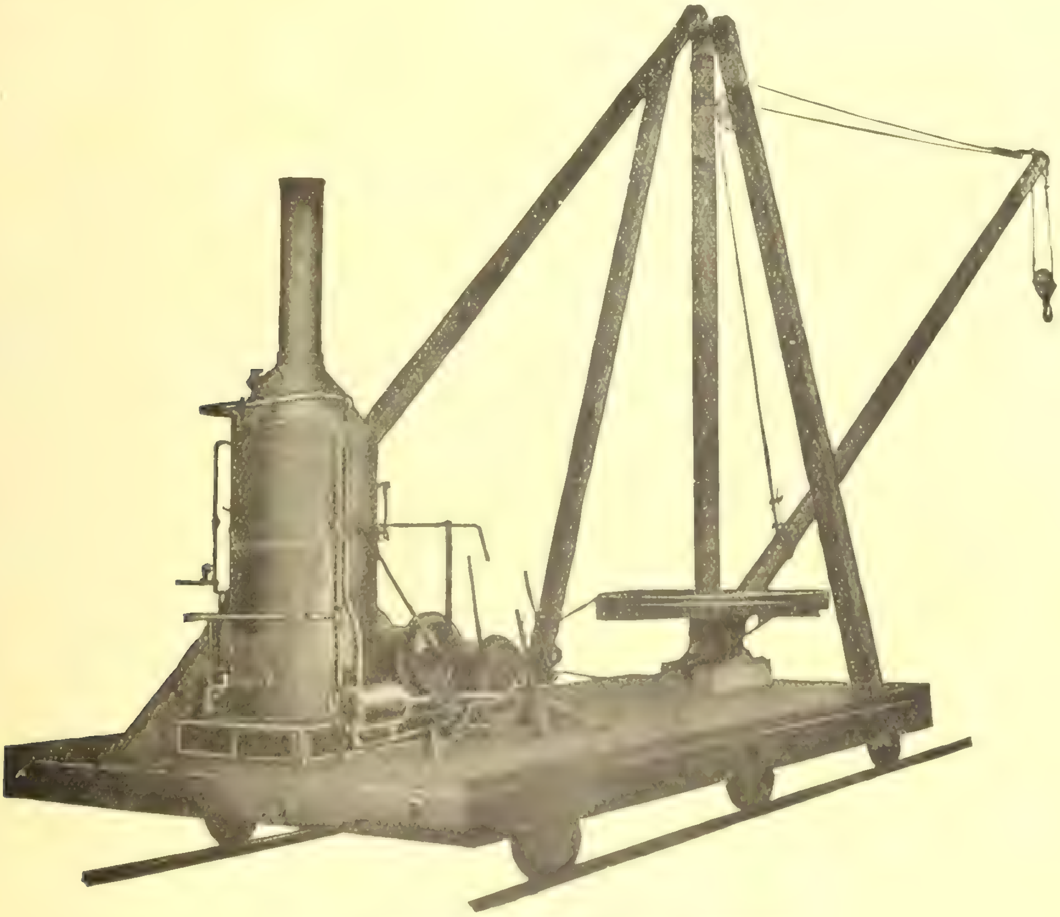

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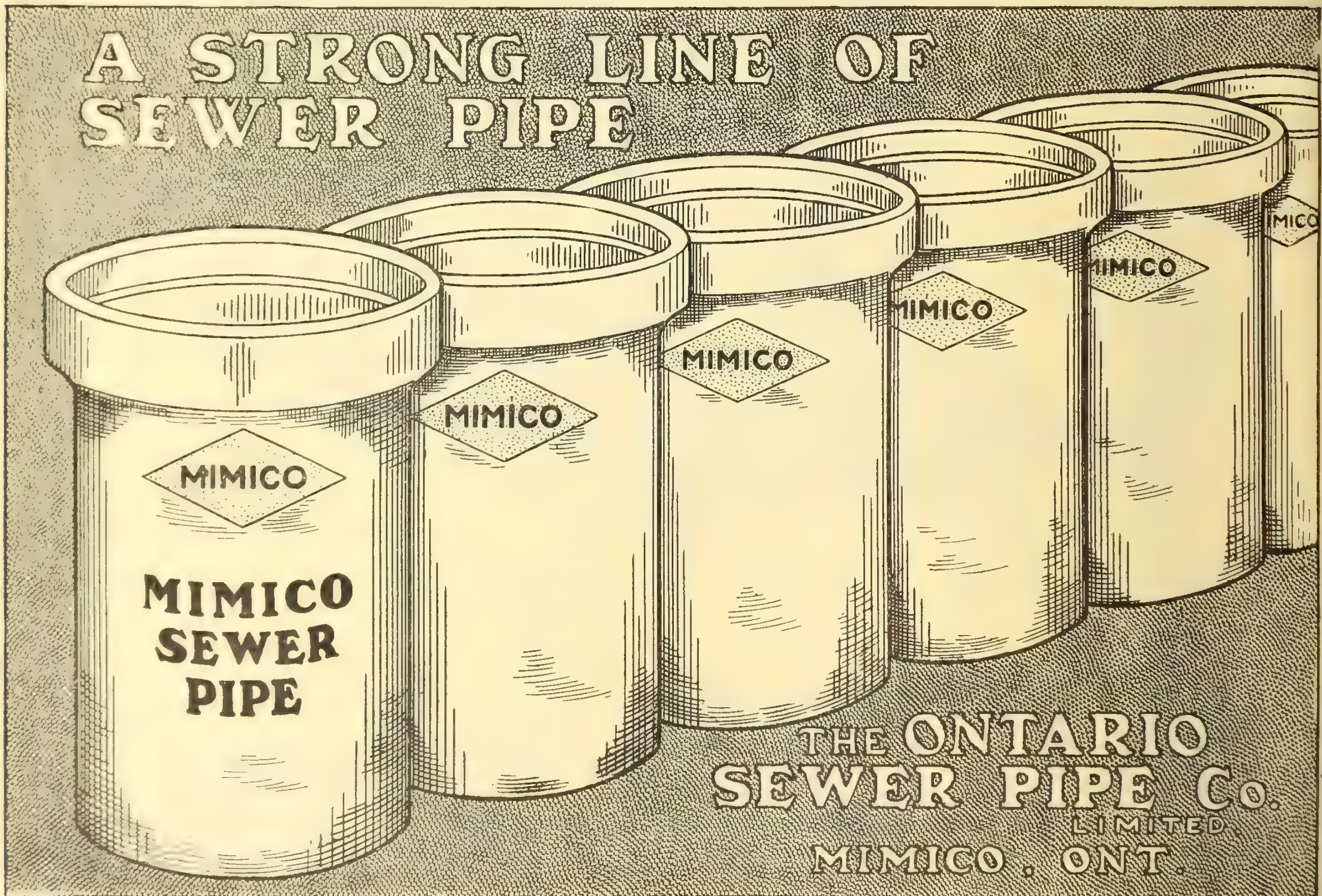

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Can They Afford To Fight Us

Various constructions have been placed upon the note recently addressed by President Taft to British Ambassador Bryce. There are two main interpretations, and each is diametrically opposed to the other. One is that the United States are assuming a dictatorial position and threatening Canada with the application of the maximum tariff, and the other that they are desirous only of opening up neighborly negotiations with a view to arriving at a just and equitable settlement. Naturally enough those who take the former meaning out of the note entertain strong feelings of resentment. They are opposed to the idea of having Canada put forward to show cause why the extreme penalty should not be imposed. Those who look at the matter from the other viewpoint are confident that a satisfactory adjustment will be made. The majority of those who are really competent to express an opinion in the matter find no cause for anxiety in the situation. The question arises: Can the United States afford to discriminate against Canada? Is it not probable that the outcome of the tariff war with Germany will have some bearing upon the course taken by the American legislators?

In so far as the field covered by this journal is concerned, the result, whatever it may be, will really be of small consequence. From the report of the Department of Trade and Commerce we find that for the eight months ending November, 1909, imports from the United States of materials entering into building and construction work represented a total of over thirty-four millions, while the value of our exports of the same kind was only slightly in excess of three millions. This particular showing is, of course, exceptionally favorable to Canada. But however much or however little the question may affect the [illegible] matter is one in which all thinking Canadians should take some interest. It has been said that Canadians are too busy to be particularly interested in the United States tariff, high or low. This is hardly the case. The situation would be defined more correctly by saying that Canadians are too dignified to concern themselves over hints, and too confident in the resources and future of their country to manifest any sign of dependence upon the United States.

Probably, those who anticipate trouble will live to learn that their fears were groundless. In any case, however, there should be no anxiety in Canada. In the light of past experience it is clear that the ultimate advantage would be with us if a tariff war were proclaimed. A small percentage would feel the rub at the outset, but the great bulk of our people would not suffer one iota. It is contended by not a few that a tariff war would have a good influence, in that it would tend to make Canadians more self-reliant and resourceful. Canada is one of the United States' best customers, and our trade is increasing by leaps and bounds—which considerations bring us back to the point: Can they afford to fight us?

Vancouver Correspondence

The Vancouver correspondence inaugurated in this issue will doubtless be read with avidity by those who regard the West in general, and the Coast in particular, as the land of opportunity. It is the aim of the publishers to make the CONTRACT RECORD truly national in its sphere and usefulness. This work will be facilitated greatly by the manifestation of a little more practical interest on the part of our Western friends. If they will send us timely notice of new contracts, as they receive them, and occasionally draft out a description of the methods employed on some recent job, sending photographs whenever possible, they will not only help to establish the CONTRACT RECORD as the connecting link of the building trades in Eastern and Western Canada, but they will contribute something to the cause of their own section in directing the attention of the "wise men of the East" to the illimitable resources and untold opportunities of a country which, as yet, has barely crossed the threshold of its career.

The Contract Record and tne Architect

It is not very long since a prominent architect told the writer that the CONTRACT RECORD was devoting too much attention to practical work, and that he thought this was a mistake. We have had many indications, however, of the general success of our policy, and the gentleman in question is in the minority. The idea that an architect cannot read with considerable profit articles dealing with the practical side of his work and the most up-to-date developments therein, is hopelessly out of date. The following extract culled from an editorial which appeared recently in the "American Architect," perhaps the most widely-read architectural journal on the continent, has a distinct bearing upon this question:

> "To be an architect in the fullest sense of the word, one should speak with just as much authority concerning methods and materials going into the actual construction of the building as he can regarding the architectural design and treatment. Clear, complete and definite plans and specifications are of great importance, but a comprehensive knowledge of materials and construction are no less necessary if the best results are to be obtained."

Beauharnois Power Development—Showing Canal Lock Entrance to Forebay

Power Development on Beauharnois Canal

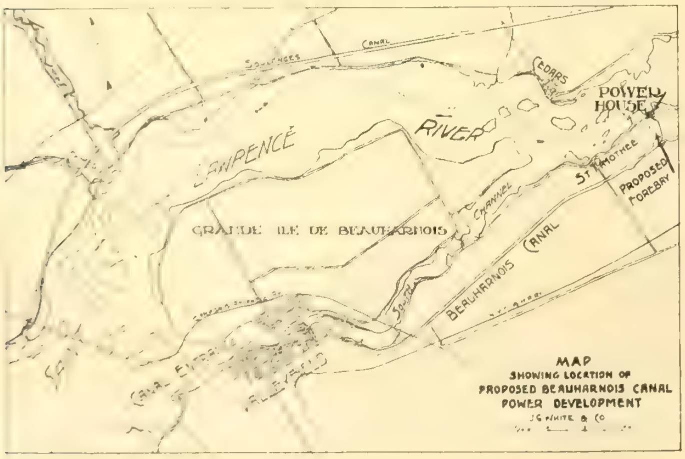
A Brief Definition and Description of this Interesting Work up to its present stage—Facilities provided by the Contractor

One of the most important additions to the industrial forces of the metropolis of Canada was put under way on the 7th of September last, when the Canadian Light & Power Company entered into a contract with George W. T. Nicholson, of Montreal, for the construction of a part of their hydro-electric plant at the village of St. Timothee, Quebec, in the county of Beauharnois. The contract with Mr. Nicholson provides for the building of a coffer dam, 980 feet long; clearing and grubbing of power house site and forebay; the excavation of the tail race, power house, spillway and headwall; the excavation of the intake and canal prism for the distance of 1,000 feet, and the building of the earth embankments for a large forebay or regulating basin, as well as the concrete for the power house substructure, the headwall and intake, also the raising of lock No. 13 on the Beauharnois canal.

Work was commenced on Sept. 10, the first step being the building of the coffer dam, to dam the Cedar rapids from a large bay on the edge of which the power house will stand. This bay has an area of 312,000 square feet, and when dammed contained eleven million gallons of water. The construction of the coffer dam was timber riprapped on the outside, being, when completed, 20 feet wide on the top and serving as a temporary highway road during construction of the works. In a short time the coffer dam was completed and water all pumped out of bay, which permitted a start being made on the excavation of the power house; tracks were laid and a steam shovel put into operation, the material from the excavation being placed in the forebay banks, when it is spread in 6-inch layers and rolled before another layer is placed.

Since the above date to the present time, work has been carried on in this excavation without interruption, and concreting is about to be started for the foundations for three power units. Work was started on the intake excavation on November 6th, and continued for ten days, when it was shut down for the winter. The quantities to be excavated are estimated as follows: Earth excavation, 215,000 cubic yards; rock excavation, 31,600 cubic yards; concrete in power house, headwall, intake, abutments and raising of lock No. 13, 32,000 cubic yards.

In order to complete the work under contract by the specified time, it has been necessary to provide an extensive and modern plant for the handling of the large quantities of materials. Steam derricks, steam shovels, numerous locomotives and dump cars are being employed in the excavations and an elaborate layout of tracks enables the convenient and quick disposal of the excavated material to any desired point on the works. The principal feature of the plant, however, is the stone

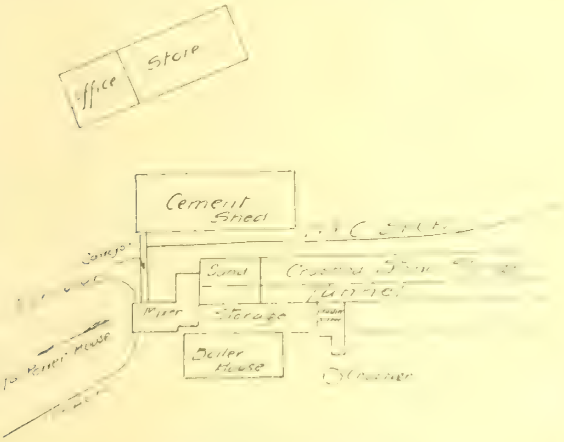


Power House Excavation in Progress

Beauharnois Power Development—Operations on the Embankment for Forebay

rushing and concrete mixing plant, which has been speially planned, and is without doubt the most modern f its kind in Canada

The stone crusher is sunk into the ground to the evel of the tracks in order that the stone may be dumped nto the same, directly from the cars. After passing hrough the screens, the stone falls directly on the top f a tunnel. This tunnel is provided with traps which permit the broken stone to feed as required into a belt conveyor which runs in the tunnel and connects with the conveyor to the mixer. The sand deposit is also reached by this tunnel and conveyor, which permit the sand being handled in the same manner as the stone.



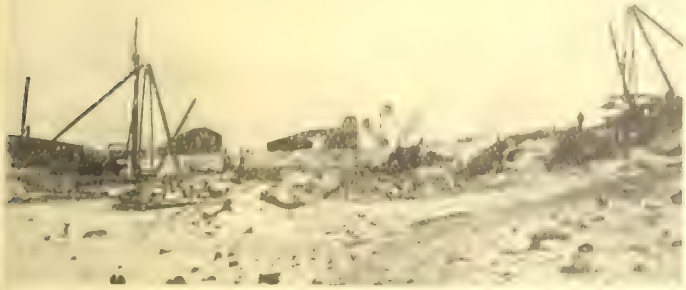
Layout of Mixing Plant.

The cement is fed to the mixer by a separate conveyor direct from the cement storage. The mixer is elevated and provided with storage bins and measuring hoppers, and an elaborate steam heating system has been installed in mixing compartments to permit concrete being placed during winter months. The concrete is conveyed from the mixing plant to the power house in skips placed upon cars, which run on a circular track leading from underneath the mixer. These skips are lifted off the cars and delivered to place by means of steam derricks. The circular track layout enables the trains to pass each other without delays and permits of a continual operation.

The development at present under construction consists of 20,000 horse power. It is estimated that the plant will be in operation by December 1st, 1910. The total capacity of this plant when fully developed is estimated at 100,000 horse power.

Coffer Dam With Highway Crossing

The offices of the Canadian Light & Power Company are located in the Eastern Townships Bank Building, Montreal. Mr. Nicholson, the contractor, has his offices in the same building. Associated with Mr. Nicholson on [illegible] Mr. E. H. [illegible] C. E. [illegible] Mr. [illegible] Finlay. The engineering and supervision on behalf of the company is in the hands of Messrs. J. G. White & Company, who are represented on the works by Mr. J. D. Evans, C.E., resident engineer.



Power House Site from West End

View of Crusher Plant

Cost System for Engineering Construction

Advantages to be derived from a uniform method of keeping accounts Complete Details of a simple and satisfactory arrangement*

The desirability of contractors throughout the country adopting a uniform system of keeping their accounts is very great. The main advantage is that gradually all engaged in contracting work will become familiar with what it actually costs them to do their work, and the very wide variation of bids which are now submitted at almost all lettings will eventually be done away with. It should prevent all but the most reckless from making proposals below cost. If these very desirable results are finally attained, the contractor's business will become a more stable one, and one in which banking houses especially would have more confidence than they have at present.

Six Main Heads for Contract Work.

The uniform system adopted should be simple, inexpensive to keep, and should have wide flexibility to permit its application to contracts of all kinds. The author has for a great many years been using a system deduced from the book keeping methods of our railroad companies, which he has found to be satisfactory in all respects. There are six general headings into which all contract work must be divided. They are as follows:

First Materials of Construction; second—Labor; third—Supplies; fourth Plant; fifth—General Expense or Administration Charges; sixth—Profit.

All general heads into which any contract is classified, such as excavation, concrete, masonry, etc., must be subdivided into such detail as may be desired, keeping constantly in mind the above headings.

For the purpose of explanation it is probably better to take an example of actual work. Let it be supposed that the construction of a reinforced concrete retaining wall is to be undertaken, the work to consist of excavation, concrete and steel reinforcement. The heading "excavation" would be divided as follows:

Labor.—(1) Excavating in Trench; (2) Hoisting Excavated Material; (3) Trucking; (4) Backfilling; (5) Shoring and Sheeting.

Supplies.—(6) Coal; (7) Oil; (8) Water; (9) Miscellaneous.

Plant.—(10) Cost Delivered; (11) Maintenance; (12) Removal.

General Expense.—(13) General Expense.

Profit.—Expenditures, during the execution of the work would be distributed as Excavation Nos. 1, 2, 3, etc.

"Concrete" could be divided as follows:

Materials of Construction.—(1) Cement Delivered; (2) Sand Delivered; (3) Stone or Gravel Delivered; (4) Facing Material Delivered; (5) Lumber for Forms Delivered; (6) Cement Bags.

Labor.—(7) Mixing Concrete; (8) Transporting Concrete; (9) Depositing Concrete; (10) Making Forms; (11) Erecting Forms; (12) Facing.

Supplies.—(13) Coal; (14) Oil; (15) Water; (16) Miscellaneous.

Plant.—(17) Cost Delivered; (18) Maintenance; (19) Removal.

General Expense.—(20) General Expense.

Profit.—

"Steel Reinforcement" could be divided as follows:

Materials of Construction.—(1) Bars Delivered; (2) Wire Delivered.

Labor.—(3) Storing and Distributing Steel; (4) Bending Steel; (5) Placing Steel.

Supplies.—(6) Miscellaneous.

Plant.—(7) Cost Delivered; (8) Maintenance; (9) Removal.

General Expense.—(10) General Expense.

Profit.—

It should be noted that in each of the above subdivisions the general headings are always included.

The "general expense" or "administration account" should be subdivided, for example, as follows:

General Expense.—(1) Engineering; (2) Bookkeeper, Stenographer; (3) Timekeeper, Storekeeper; (4) Telephone, Stationery, Sundries; (5) Rentals; (6) Legal Expense; (7) Surety Bond; (8) Liability Insurance; (9) Watchmen; (10) Interest and Discount.

In preparing a bid for work of this character the cost of each one of the above items should be carefully estimated with the best data available, and the charges for the general expense, plant and profit should then be apportioned to the various items of the work as above indicated in accordance with their relative value. In this way the unit price that should be submitted for the excavation, concrete and steel reinforcement can be determined. If such a method of computing would be adopted by all competitors, then there would be but little variation in their bids, and surely the low bidder could not be very much too low. The method which is used by so many contractors at the present time of jumping at the price that they should submit is one that cannot be too strongly condemned.

When the work is started, ledger accounts should be opened with each item as above enumerated.

The general expense account should be kept separately with subdivisions as above suggested, and then at intervals, by means of journal entries, should be transferred to the excavation, concrete and reinforcement accounts, using the same percentages of apportionment which were used in making the proposal. By simply adding up all the accounts of any one class and dividing them by the amount of work done, the cost of execution at any stage of the work can readily be determined.

No Complicated Books Required.

The books required for such a system of accounts are of the simplest character, and can be purchased at any stationary store. They consist of cash book, ledger, journal and voucher book.

The voucher system should be used. As is well known, under this system all bills and pay rolls are inclosed in a blank, on the back of which is a place for distributing the amount to the proper accounts.

If it is desirable to keep a running account with the parties with whom much business is done, their vouchers can be credited to them, charged to the voucher account, and placed among the paid vouchers.

In the case of a contracting concern carrying on a number of contracts at the same time, ledger accounts should be started with the contracts themselves, each given a number and a subsidiary set of books kept for each contractor.

In order to aid in the distribution of the pay roll a system of cards may be used, upon which are placed the amount of labor expended under each head for each day. This work is usually done by the assistant engineer from the reports of the time keeper and the foremen of the various gangs. One set of cards is used for each week. These cards are very valuable for keeping track of labor costs, checking the pay roll, and should, if properly kept up, prevent all disputes or padding of pay rolls.

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*A paper by Mr. Gustave Kaufman, read at the January meeting of the American Society of Engineering Contractors.

As can be readily seen, the above system as outlined can be used for any kind of contract work, the headings being arranged to suit the work on hand. These headings can be subdivided to any refinement desired by the contractor.

The system is very inexpensive, as it requires no elaborate forms and no more help than is usually required. As far as the author, aided by many years of experience, is able to judge, it meets all the requirements that a uniform system of accounts can need.

Cost of Concrete Buildings

Reinforced concrete will generally run from 5 to 15 per cent. higher in first cost than first class mill construction, and will be from 10 to 20 per cent. lower than steel construction fireproofed. A large warehouse in Brooklyn was begun in May, 1908. At that time new construction work was scarce, and all contractors figured very closely. The successful reinforced concrete figure was $30,000 lower than the best bid on the same plans in fireproofed structural steel. A large factory in Philadelphia was designed in steel. The architects considered an alternative in reinforced concrete and saved $60,000. A large publishing house and loft building was recently completed in Springfield, Mass., of reinforced concrete throughout, thereby saving $40,000 over the probable cost in steel. These three instances represent respectively savings of 12, 25 and 10 per cent. In competition with mill construction the percentage depends almost entirely on the size of the building. For structures costing $40,000 and less, and of a height of four storeys or less, the brick and wood construction will run about 15 per cent. less than concrete. On larger buildings, however, concrete gets closer to the cost of the mill construction. The designers of a very large hardware building in Minneapolis were surprised to find concrete figures slightly under those of mill construction. A similar case occurred in Toledo, Ohio. Both of these propositions exceeded $150,000 in value.

In considering the costs of different types of construction the initial cost should not be the only criterion. There are certain fixed charges which enter into the relative values of buildings. These may be briefly summarized as follows: Insurance, maintenance, depreciation, amount of light available, freedom from vibration, elimination of vermin, and the assurance that a fire cannot destroy the building. It is difficult to put an exact monetary value on these different items. Each plant manager would have his own views and local conditions would alter materially any assumptions. If, however, due consideration be given to the saving which can be obtained on each of these items by the use of reinforced concrete building, it will be generally found that even though the concrete structure cost complete 10 per cent. more than mill construction, there will be a saving annually of from 1½ to 2 per cent .

These conclusions were drawn by Mr. J. P. H. Perry, of New York City, in an address on the use of reinforced concrete for textile mills, at a convention of the (American) National Association of Cotton Manufacturers.

The Toronto branch of the Canadian [illegible] Engineers met on Thursday evening, February 24th, in the Chemistry and Mining Building at Toronto University. Mr. W. S. Kinnear, Chief Engineer, Detroit River Tunnel Company, delivered an interesting lecture on the construction of the Detroit river tunnel. Mr. A. W Campbell, chairman of the branch, presided.

An Improved System of Bricklaying

Concrete has made such rapid progress during the past few years, and has, in so many cases, proved such an important competitor to bricks as a building material, that it is of the greatest importance that all interested in the use of bricks should use their best endeavors to reduce the cost of bricklaying to a minimum, without in any way decreasing the stability of the structure, if this is at all possible.

A number of variations from the ordinary practice which have been made by Frank B. Gilbreth in the United States are of more than passing interest. Mr. Gilbreth has for some years had a high reputation for rapid erection, and is one of the most successful contractors in America, and he has brought to bear upon the subject of bricklaying a wealth of ideas and suggestions that are remarkable not only for their novelty, but for their practical value. His national reputation for the execution of large contracts in a phenomenally short time is a guarantee of the success of his methods.

The Scaffold

In the first place, the scaffold used by Mr. Gilbreth is arranged in such a manner that the bricklayer does not need to stoop unduly over his work; the argument being that as a carpenter does not stoop to the floor to plane a piece of wood, but works with the wood on a bench, so the bricklayer should work in a position best calculated to enable him to work with the greatest possible speed and with the least waste of energy by unnecessary movement. The Gilbreth scaffold is so constructed that it can be raised and lowered so readily that the workman does not need to stoop an inch lower than the height best fitted for his work.

The Fountain Trowel

A further saving of time is effected by the use of a special trowel, which is as different from an ordinary one as a fountain pen is different from a pen of the ordinary kind. Just as a writer may increase the speed of writing by using a fountain pen and so avoiding the frequent journeys to the inkstand, so the bricklayer working on the Gilbreth system may save nearly a quarter of his time by discarding the ordinary trowel and using one with a much larger supply of mortar—in other words, a fountain trowel. Such a trowel is in the form of a long can, somewhat resembling a shoe, one end of which is flattened so that it may be used top scrape or scoop up the mortar in order to fill the trowel, whilst the other end has an opening so adjusted as to give a stream of mortar of the correct width. It is claimed that this device enables the mortar to be spread much more rapidly and evenly than usual, and it permits the mortar to be used sufficiently soft to fill the joints better than usual, particularly in the middle of the wall.

The "Packet" System of Bricklaying

In the ordinary method of bricklaying a large amount of time is lost by unnecessary handling of bricks by the bricklayer. Much of this is avoided by Mr. Gilbreth in what is termed the "Packet" system. This consists in the substitution of a definite arrangement of the bricks directly they leave the cart which delivers them on to the site, so that, with a minimum [illegible] position, they are easily [illegible].

[illegible]

bricks can be piled in separate packets) nor to pick up parts instead of whole bricks is very great, as the sorting can be done by less highly paid laborers, each kind of brick being placed on a separate packet. Mr. Gilbreth states that he has proved by long practice that a bricklayer's output may be doubled by the adoption of this simple system, and the saving on the cost of laying is still further reduced by the saving in handling the bricks in packets as compared with the ordinary method.

Thus, everyone who has watched a bricklayer at work knows that he turns a brick about in his hand before laying it. This is necessary for him to find the best face, and to grasp the brick properly for laying. In the "packet" system, the bricks are so laid as to be in exactly the right position for laying, and all this unnecessary handling is avoided.

In these ways the system of working adopted by Mr. Gilbreth is capable of effecting a mild revolution in bricklaying, and one which is not likely to be resented by any one, as the bricklayer works less although he lays more bricks, and no reduction in actual wages takes place. The great difference is that time and energy which are now wasted, are devoted to bricklaying, and consequently the employer benefits as well as the men.

The Design of Reinforced Concrete Beams

Careful Investigations of the subject result in the production of a new Reinforcing Bar and a Unit System with rigid connections

By E. Cannes

The writer has noticed in designing reinforced concrete beams that the ordinary method of bending up a part of the main horizontal rods and of ending the remainder at the supports does not always give the same satisfactory results, when heavy beams, as for instance for railroad and highway bridges, are concerned. The maximum vertical and horizontal shear then take place when the drive wheel is near the support of the beam and is very large. The number of rods sufficient to resist the bending moment are not sufficient to take up the vertical and horizontal shear as well. The horizontal shear or strain tend to make the rods slip in the concrete just as in the case of a steel plate girder, it tends to cause the flange angles to slide horizontally past the web. The rivets counteract this tendency.

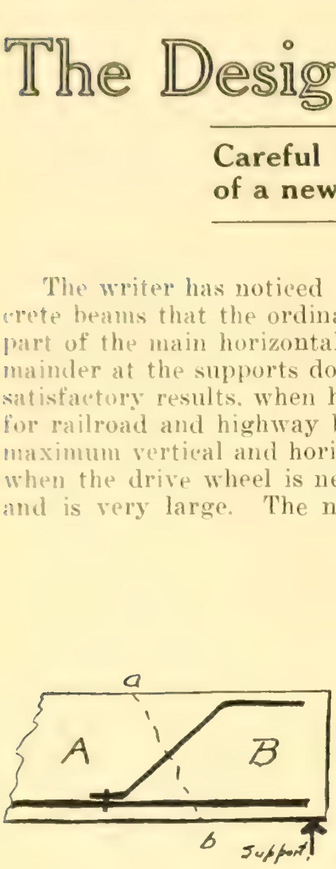


Fig. 1—Detail Showing Need of Rigid Connection of Shear Member

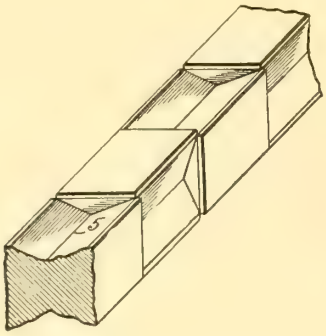


Fig. 2—Detail of Specially Rolled Bar.

In a reinforced concrete beam, the bond between concrete and rods takes the place of the rivets of the steel girder. As this tendency is maximum at the supports, it is necessary to have a certain amount of rods end at the support and develop the necessary bond to resist this tendency. The remaining rods are not sufficient then to take up the vertical or diagonal shear and vice versa. Certainly this difficulty can be in a certain measure overcome by increasing the number of the rods in making them of a smaller size, but this increases the cost of the beam and often lends to the increase of the size of the beam itself. This method is also wrong from a theoretical point of view, since we are limiting the number of rods necessary to take up one stress (shear) by the amount of rods found sufficient and necessary to resist another stress (flexure). A steel girder is not designed, this way; the thickness of the web is determined independently from the section of the flange angles. The rational design of a reinforced concrete beam would therefore be to have all the horizontal main rods end at the supports and have separate bars inclined at an angle of 45 degrees to take up the diagonal shear. These latter will have to be rigidly anchored top and bottom in order to develop their usefulness, as it may be seen from the accompanying sketch, Fig. 1.

The failure of a concrete beam by diagonal shear takes place along the line a-b. Part A tends to break away from part B. In placing rods in the opposite direction and normal (right angle) to a-b, this tendency will be counteracted and the rods will hold the parts together. It is evident that this can only be accomplished when the rods are rigidly anchored top and bottom. These diagonal rods can be made of any length and rigidly attached at points determined by computation. They may be attached at the bottom to the main horizontal rods and either prolonged at the top in the concrete long enough to develop their strength, or rigidly attached to another rod placed at the top of the beam. This latter does not need to run from end to end of the beam, but only a certain distance from each end of the supports.

Although such a design would be an ideal one for reinforced concrete, its realization seemed to be impossible, as rods now in use are not adaptable for such rigid connections. The writer had, therefore, made up his mind to design a rod and device which would make such a design possible.

Fig. 2 shows the main tensile rod in question. Its section, although not having the form of a square, is nevertheless equivalent to a perfect square and therefore uniform. The rod has been rolled and some samples of it tested. The tests have given very good results.

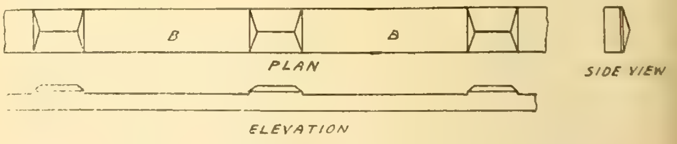


Fig. 3—Details of Specially Designed Section for use as Shear Members.

The bond especially seems to be perfect as all the three rods tested could not be pulled out from the concrete. but broke outside the concrete at the following pull:

No. 1 bar broke at 48,100 lb.
No. 2 bar broke at 49,150 lb.
No. 3 bar broke at 47,880 lb.

The tests were made with ¾-inch rods imbedded 20 inches and after 28 days. The features of this rod are such that diagonal shear rods can be rigidly connected to it. Fig. 3 shows the shear rod in plan and elevation. It is of a flat section and is provided on one side with projections shaped to conform to the shape of the depressions of the main rod, so that the two rods can be interlocked. A collar and a wedge keep them firmly together. As the width of the collar is equal to the distance between the projections of the main rod and the collar is inserted between these projections, it is evident that any sliding or relative longitudinal movement of the rods is impossible. The connection is thus rigid and perfect.

Fig. 4 shows this connection in elevation plan and section, A is the main rod, B the diagonal shear rod, C the wedge and E the collar.

A rigid connection can be made also with two main rods. A special plate having projections shaped to fit the depressions of the main rods and which interlock with them is used. One or two collars hold them firmly together. Nevertheless, the writer is of the opinion that the use of the special shear rod will prove to be more economical and more practical.

Fig. 5b shows the application of the design with rigid connections in its simplest form. The diagonal shear rods are rigidly connected at the bottom of the main tensile rods and anchored at the top in the concrete. Fig. 5a shows the design where the top end of the shear rod is also rigidly connected to a main rod placed at the top of the beam. A real "unit" is thus obtained.

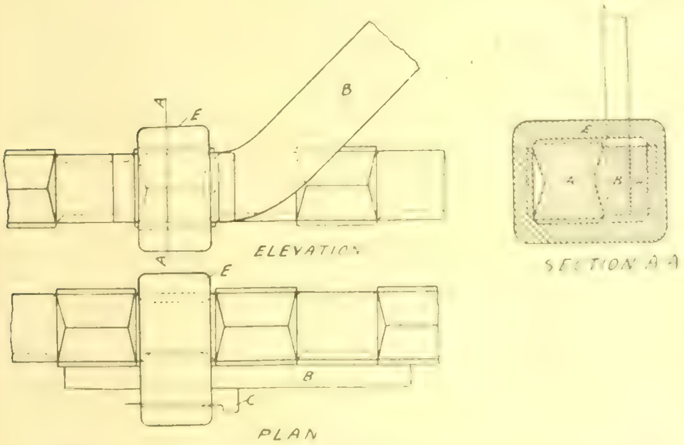


Fig. 4—Rigid Connection of Shear Members Secured by Specially Rolled Sections.

Every concrete engineer knows how important it is to be able to hold the steel in the right place during the process of concreting. The writer is using for this purpose special bar separators, as shown in Fig. 6. Two plates fitting between the projections of the main tensile rod and having projections shaped to conform to the shape of the depressions of the same rods are placed at the top and bottom of the main rods, one opposite the other and the whole held firmly together by bolts. In placing these separators at the bottom and top of the beam, as shown in Fig. 5a, several units are joined and held firmly together. A "multiple unit" system is then obtained. In this figure (5a), A are the main rods, B the shear rods, E the collars with wedges, and G the bar separators. The advantage of such a "multiple unit" system cannot be denied, as the separate parts forming the skeleton of a beam can be put together at the mills and shipped as a unit to the place of the construction work. It can be easily lifted if it were necessary, with a derrick to any height in the same way as it is done with a steel girder.

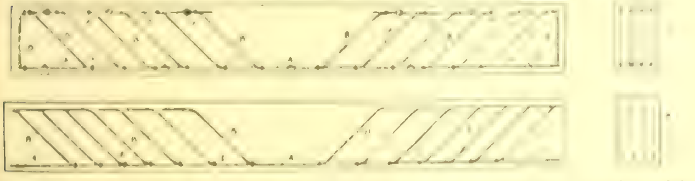


Fig. 5—The Upper Sketch (5A) Shows a Reinforcing Unit with Rigid Connections at Both Top and Bottom. The Lower Sketch (5B) Shows a Rigid Connection Below Only. Upper Anchorage Dependant Upon Bond.

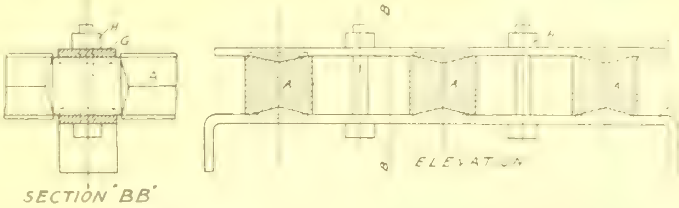


Fig. 6—Sketch Showing Arrangement of Spacing Saddles to Secure Exact Placement of the Steel.

This design with rigid connections can be also applied to reinforced concrete columns. The vertical rods are rigidly connected to each other by diagonal rods. It is a well-known fact that concrete columns fail often by diagonal shear at an angle of 45 degrees. The diagonal rods will take up this shear and the strength of the column will therefore increase.

In summing up, the writer will say that the use of separate diagonal shear rods rigidly connected to the main tensile rods will put the design of reinforced concrete beams on the same rational basis as is the design of a steel girder. The flange stresses will be taken up by the horizontal rods and as all these rods end at the supports the horizontal shear, which tends to make the rods slip in the concrete, will be amply taken care of. As to the web stresses, they will be taken up by the separate inclined rods rigidly fixed, top and bottom. Their length, their number and their spacing as well will not be arbitrary or dependent on the shape of the horizontal rods, but will be determined by rational computation only.

This design will do away also with the vertical stirrups, the usefulness of which is rather doubtful. Such a design is certainly to be desired and will be an ideal one.

Rivalry Saves Money on Concrete Building

The practical value to the contractor of introducing the element of competitive sport, or rivalry, into the layout of work for his labor gangs has seldom had a more emphatic illustration than is afforded by the experience last summer of the Aberthaw Construction Company of Boston in erecting a pair of factory buildings for the Winchester Repeating Arms Company at New Haven, Conn.

Except that there was a steel-frame plaster-walled storage building to go on the roof of one, the two buildings were duplicates and were connected by a corridor which opened off the elevator well and toilet rooms which served both buildings. The plan of the work was a letter "H" with the toilet and elevator building the connecting link between the two verticals. Each of the buildings was 200 feet long and 60 feet wide, two stories high, with the columns spaced 20 feet by 24 feet and built heavily enough to provide for two additional storeys in the future. The interior construction was of flat slab concrete floors built on the Turner mushroom system, supported by steel columns. A beam ran between the exterior columns and supported a brick panel under the concrete window sill. A tunnel ran under both buildings and there was no choice as to the amount of work on each of the buildings.

A very careful estimate of the exact amount of work involved in each building was made, and a dividing line drawn 6 feet, 8 inches one side of the centre line of the connecting corridor. The figures were shown the foremen who were to be put in charge of the two buildings, and they agreed that the division was an absolutely fair one. The foremen snapped up a cent for choice of sides. Duplicate equipment was furnished for the two sides and it was agreed that the foremen should have the selection of their labor bosses, carpenter foremen, and within reason a free hand in the number of carpenters and laborers that were employed on their buildings. The company offered a bonus of a certain amount of money to the men in charge of the two buildings in a given proportion according to the economy shown in getting the work into place.

From the very start of the job, rivalry between the two sides began to grow. The amount of centering placed by the carpenters on one side was carefully noted by the men on the corresponding work of the other building. The north had started two days ahead of the south building and any marks set by the men on the north side drew corresponding speed from the men on the other building. At the first of the job it was considered that a good day's concreting had been done when two bays of length of floor had been cast the width of the building. At the last of the job the men had put in three bays in eight hours, an increase of over 50 per cent., part of which could be charged to experience in handling the work to better advantage and a large amount to pure rivalry.

In computing the saving on labor costs due to this competition of working gangs, the basis of comparison is necessarily somewhat a matter of opinion. The Aberthaw Company adopted as a basis the unit labor costs per yard of concrete, per square foot of forms, and per ton of steel, in two other concrete buildings of about the same size as those at New Haven. Using this standard it appeared that the saving in labor costs on the New Haven job yas 19 per cent. on the concrete labor, 5 per cent. on the labor on forms, and 22 per cent. on the labor on steel erection. The total saving on all labor items was 10.8 per cent. of the labor cost for the job as it would have been without competition, figured from the other buildings taken as standard work. In any such estimate there is, of course, room for differences of opinion, because the labor cost in concrete buildings is so largely influenced by matters of design, and in estimating the weight to be assigned to such differences judges might not exactly agree. But with all reasonable allowances on this head it seems evident that by this competitive system the Aberthaw Company did get out of their New Haven job with an outlay for labor about 10 per cent. less than that outlay would have been without the rivalry between the working gangs. There was less than $400 difference in the labor cost of the two wings.

Use of Tar in Macadam Road Construction

English Methods of Tar Painting, Mixing and Grouting—Preparation and Use of Material—Pros and Cons and Cost Data

In a paper read before the Northern District Meeting of the Institution of Municipal Engineers, Mr. Wm. Wade, assistant surveyor to the Northumberland County Council gave the following information, drawn from his own experience, regarding the use of tar:

Tar Painting.—Tar painting may be used on either an ordinary road, made in the usual manner, or upon a new stretch of metal. In the case of tar painting, a stretch of road which has carried traffic for some time, it is essential that all dust should be removed from the road before the liquid is applied. After the removal, the road is then ready for the application of the tar, which is heated in tanks of various sizes. These tanks are fitted with distributors or jets, and tar at the proper temperature is applied by pressure so as to secure a certain amount of penetration as well as equal distribution. The tarred surface has then granite, spar or other suitable screenings sprinkled over it. The cost of tar painting works as follows: One gallon of tar will cover an area of from 10 to 20 square yards, at a cost of from 1d. to 1½d. per square yard.

Tar Macadam.—I have now to deal with the second method —viz., that of thoroughly mixing the stone with tar and pitch previous to its being laid on the highway. This is perhaps better known to you as tar-macadam. As it is absolutely essential that all stone should be perfectly dry and free from moisture, you will readily see that a shed or some covered-in structure will materially help in getting the work done in a speedy and efficient manner. The stone used is of three sizes—2½-inch, 1½-inch and ½-inch—and should be free from dust and moisture. The tarring may be done by hand or by machinery. The latter method is much cheaper, and I find that machine-tarred stone is superior to that mixed by hand. After the stone is tarred it is stacked in separate heaps. The best results are obtained when the tarred material is allowed to be undisturbed from one to three weeks before it is applied to the road. I omitted to mention that the proportion of pitch must be greater for the bottom coat than for the two succeeding ones.

The 2½-inch stone is first put on the road foundation. Above this the 1½-inch is placed, and the ½-inch is used as a finishing coat, over which is sprinkled ⅜-inch dry granite screenings free from dust. Each layer of stone is well rolled before the one above is put on. It is very necessary that more than ordinary care should be taken in the consolidation of the separate layers. When completed, the combined thickness of the three coats gives an average depth of 4 inches, the depth of material, of course, being greater in the centre than on the sides of the road. A 15-ton roller is preferable, especially if the traffic be heavy, for if a light steam roller be used, when traffic heavier than the roller passes over the road, the result will, in all probability, be disastrous for the road. One ton of barred stone will cover an area of 6 square yards, and the average quantity of tar required for 1 ton of stone is 8 gallons and 20 pounds of pitch.

The 8 miles of tar-macadam laid by the Northumberland County Council cost on the average [illegible] 2s. 2d per square yard, inclusive of mixing plant, etc. The roads treated were structurally weak—a penned bottom of 6[illegible] whinstone was laid down on the existing road to give a [illegible] foundation, on which the tarred stone was placed. Good drainage and strength of structure are important factors in the laying down of a successful tar-macadam roadway. The cost of reconstructing a road by means of penning it with 6-inch of whinstone varies from 10d. to 1s. 6d. per square yard, according to the distance the stone has to be brought.

Tar Grouting.—And now I co[illegible] deal with the third method, that of tar grouting the ston[illegible] tar and pitch when the road is being coated.

Before beginning tar grouting it is necessary to take into consideration the weight of roads and the nature of the traffic the road is likely to be called upon to carry. This will altogether determine the size of the broken stone, its quality and the thickness of the coat to be laid on the surface. On roads that carry heavy traffic 3-inch hand-broken whinstone should be used, while on those where there is no motor wagon or locomotive traffic, I would recommend 2½-inch.

After the stone is laid on, it is slightly rolled. The pitch and tar are together heated in tanks to boiling point and a quantity of creosote oil is added. Stirring is necessary to enable the ingredients to be thoroughly well assimilated.

The boiling matrix is poured in the interstices by means of a specially made can and distributor. Each individual stone is thus thoroughly well grouted and embedded in or surrounded by the mixture. While still hot, ⅜-inch slag or whin chippings are applied and properly consolidated with a 15-ton roller until an integral crust is formed.

I have given a very brief outline of the preparation and use of material for the three different methods of treating a road with tar as a binder. I now propose to deal with, in as concise a manner as possible, the various advantages and disadvantages connected with these respective modes of road making and repairs. At the outset, let me say that I consider wet rolling will shortly be a thing of the past on our main highways where motor traffic has to be dealt with.

Tar painting may with great advantage be used on suburban roads where the traffic is light or where the dust nuisance is greatly felt and watering has to be resorted to. The tar acts as a protection, and protects the life of the road surface so long as it is dry. It has this great drawback, being only externally applied, it breaks up in wet weather, and the combined action of the wheels and horses' feet soon puts the roads into an uneven and dirty condition. This, of course, applies to roads where the traffic is heavy. To sum up, tar painting is not to be compared with either tar-macadam or tar grouting as far as lasting properties are concerned. The tar in this case is not so much a binder as a protection to the road surface.

Advantages of Tar-Macadam

(1) The small stone of which the crust is composed being well tarred before being laid on the road gives a compact and smooth surface.

(2) The tar-macadam road is perfectly sanitary and almost dustless, so that cleansing is reduced to a minimum.

(3) It is easily repaired and the cost of maintenance is 30 per cent. less than that of ordinary macadam.

Tar-macadam, as no doubt you are aware, is not without its drawbacks. The chief of these, so far as road authorities are concerned, is the heavy initial cost. From the point of view of those using the road, the slippery nature of the surface, especially during hoar frosts, is an objectionable feature. However, this remedies itself in course of time by the tar gradually leaving the road dry by evaporation. Locomotive traffic tends to cause the top layer, which is only 1½ inches thick, to become separated from the layer below. This, of course, means the break up of the road so far as the crust is concerned. This is the reason why tar-macadam is not adapted for heavy loads.

Tar grouting differs from tar-macadam in these respects:

(1) By broken stone being applied in one coat.

(2) The stone is of a uniform size.

(3) Owing to a larger quantity of pitch being mixed with the tar, the mixture quickly solidifies and adhesion is instantly secured,, in much the same way as is done in the wood or granite paving.

The Northumberland County Council has this year (1909) tar grouted 15,436 tons of broken stone on a stretch of upwards of 14 miles of main road in various parts of the county. This work, I find, can be carried out very satisfactorily by doing one-half of the road at a time. I may say I did not receive a single complaint while the work was in progress. Furthermore, there was an entire absence of loose stones—generally an annoying feature on ordinary newly-rolled patches. In September last I supervised the work of making the road approaches over a new bridge. Clay was used in order to bring the roadway to the required level. You are all aware of the difficulty of making a satisfactory [illegible] after these approaches had [illegible] then coated with 2½-inch [illegible] by tar grouting I was [illegible] at once. The cost of tar grouting is no more than that of repairing a road by the old [illegible] method.

A tar grouted highway is [illegible] the nearest approach [illegible] have to an ideal road. It is certainly for mixed traffic superior to the other methods I [illegible]. I must not omit to say [illegible] for motor as that of tar m[illegible].

The World's Record in Masonry

More masonry was placed in the Ashokan dam at Brown Station, near Kingston, N.Y., during the last month than has been laid in the same length of time in any other similar structure in the world. Not only was the record surpassed, but the mark was placed so far beyond any other achievement that it is likely to stand for some time unless it should be eclipsed at the Ashokan dam itself in the near future.

The figures for the monthly estimate of the contractors show that 35,259 cubic yards were placed, adding to the dam a mass of masonry about 800 feet long, 120 feet wide, and 10 feet high. The nearest approach to these figures in any similar case is the record made a year ago at the Croton Falls dam, when about 26,000 cubic yards of masonry were put in place in one month. In the irrigation work of the reclamation in the west, the highest monthly progress was 18,000 cubic yards on the Roosevelt dam.

The enormous amount of work done at the Ashokan dam in so short a time is considered by those in charge of the work as indicative of the adequacy of the plant and equipment. The masonry in the dam was begun the last of September, 1908, and up to the present time about 150,000 cubic yards have been laid. The completed structure will contain about 500,000 cubic yards.

Concrete Paving Work

Concrete Pavements have been laid upon a number of streets and bridges in Memphis, Tenn., according to the "Municipal Journal and Engineer." In one place 500 feet of street were paved with 1:2:4 concrete, 6 inches thick, consisting of Portland cement, sand and equal parts of crushed limestone and crushed granite; after seven years' use the pavement is said to be in excellent condition except for a width of 4 inches along the rails of a street car line. Another section was laid in 1903 upon a reinforced concrete bridge and the surface was finished with granolithic top, 1½ inches thick; up to the present time it is said that no repairs have been necessary. Three other bridges and a number of streets also have been paved with concrete within the last two years and have shown no appreciable wear. An experimental strip, 4,300 feet long, was put down between the rails of a street car track and for 2 feet beyond the outside rails; it consisted of a concrete foundation on which was placed a 3-inch concrete wearing surface. This construction, it is stated, has not been entirely satisfactory and all concrete is now made monolithic.

Trade Enquiries

The Dominion Government Trade and Commerce Reports contain the following trade enquiries. Readers of the Contract Record may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

138. Representative.—An important firm in London, manufacturing constructional steel-work, is desirous of appointing a reliable Canadian engineering firm to represent them.

139. Agents.—A London manufacturer of gilt mirrors and overmantels, etc, wishes to appoint Canadian agents.

188. Agents.—A Scottish firm of hydraulic and general engineers is desirous of appointing agents in all parts of Canada.

189. Agency.—A Cheshire firm of engineers manufacturing a new steam turbine of the high, low and mixed pressure type; also blowers, compressors, pumps, etc., wishes to introduce this machinery into Canada.

[illegible] Slate Battens.—A Manchester firm [illegible] to correspond with Canadian exporters of slate battens.

268. Agents.—A London firm manufacturing bitumen, as[illegible]

[illegible] Portland Cement Company, whose works and [illegible] installed a new No. 6 type K rock crusher of 60 tons hourly capa[illegible]

The Imperial Car, Dry Docks & Shipbuilding Company have commenced building operations on their extensive waterfront [illegible] North Vancouver.

Trade News from Montreal

Good building season in prospect Harmony between Labor and Capital Contract Reform under way

Office of the CONTRACT RECORD,
Montreal, Feb. 28th, 1910.

With the month of February passed, a noticeable stir in the different building trades can soon be expected.

As far as new building prospects are concerned, the outlook is particularly bright and architects are rapidly completing plans for structures to be commenced in the spring. From the outlying districts reports received seem to point to a building boom.

There is an active demand for houses in the Verdun district and local contractors expect to commence the construction at an early date of a number of residential flats on the Lower Lachine road.

In Maissoneuve the town council are planning extensive improvements, and a large amount of concrete sidewalks and pavements will be laid. It is expected that Rosemount will be annexed to Maisonneuve in the present year, and this move should in time mean the extension of building operations in Rosemount.

In the Outremount district, building is expected to continue at least at the same rate as last year. The town council is now considering amendments to the building by-laws in order to insure the installation of efficient systems of plumbing, heating and electric lighting.

The Board of Trade in Lachine are this year making special efforts to boom the city and the advantages it offers to manufacturers who have in view the establishment of warehouses and factories.

No Labor Troubles Anticipated

This season there is very little prospect of trouble to contractors on the score of the labor question. Workmen generally are satisfied with the prospect of work in plenty with the opening of spring. The painters and decorators are said to be considering a new schedule of wages, but it is expected that this question will be amicably arranged without loss of time to either employer or laborer.

New Method of Letting Civic Contracts

With the time rapidly approaching when tenders for the present season's public work must be awarded, the Board of Control are actively engaged in improving the system of awarding this civic work. A former custom in connection with this street paving contract was to call for tenders for certain classes of pavement and then to award contracts before deciding where the work was required. This year City Surveyor Barlow will be asked to make a report outlining the streets where walks or pavements are required and also to recommend the style of material to be used. It is hoped also to call for individual tenders so that the contractor will know beforehand just what portion of the city's streets he is bidding on. This is not his privilege under the present system, and its unfairness to both parties is very perceptible.

Ice Palace Litigation

The ice palace completed for the Montreal Carnival Committee by Messrs. Corriveau & Brunet in the latter part of January is now forming the subject of a law suit. The winter carnival did not prove a financial success, and the promoters as a result were considerably out of pocket.

The contractors were unable, owing to the unfavorable weather, to carry out the construction of the ice palace on the scale intended, but they are, however, demanding $4,000 from the committee which they allege is due them on their contract.

Discussion of Water Purification Methods

A lecture on "Water Filtration in Theory and Practice" was delivered recently at McGill University by Mr. G. C. Whipple, of the firm of Messrs. Hazen & Whipple, consulting engineers, New York. A number of the city of Montreal officials who are interested in water filtration were present.

The speaker enumerated various methods of purifying the water supply, including filtration coagulation, aeration and disinfection, the sand filtration system being the favored of these processes.

The choice between a sand process of filtration and a mechanical system was, according to Mr. Whipple, a more difficult problem. The former was perhaps more preferable, for although more expensive to install, its operation was very much simpler and less costly.

Proposed New Dry Docks

Considerable interest is manifested in Montreal in the negotiations which the Dominion Government have on hand at the present time concerning the location of dry docks in several of the Canadian seaport cities. There seems no reason to doubt that the Government authorities intend shortly to make a definite move towards the establishment of dry docks in Canada.

The cities which would be taken into consideration would probably comprise Montreal, Quebec, St. John, Halifax, Levis, and Sydney, and it is felt here that Montreal would be one of the first to receive this addition to its harbor facilities.

Speaking generally, the cost of a floating dry dock would be about one-fifth of that required to build a similarly equipped permanent dock. A floating dock that would meet the requirements of the Montreal shipping trade would cost in the neighborhood of one million dollars, depending, of course, upon its lifting capacity. In conjunction with the dry dock the establishment of a ship-building plant would be necessitated, and one of sufficient proportions to meet the requirements would mean the expenditure of probably another million dollars.

The firm of Swan, Hunter & Wigham Richardson, Limited, of Wallsend-on-the-Tyne, England, who are represented in Canada by Mr. Clarence I. de Sola, of Montreal, have had on exhibition for the past week, in the Montreal Board of Trade Building, an excellent model, approximately 8 feet by 2 feet, of a self-docking and floating dock, which contains also the model of a steamer built for service on the Great Lakes and canals of Canada. The model of the floating dock is particularly interesting, and from a study of it an idea can be obtained of the principle by which these docks are operated.

Dominion Express Building

A short time ago an announcement was made in the CONTRACT RECORD to the effect that the block at the corner of St. James and St. Francois Xavier streets, the present site of the St. Lawrence Hall, had been sold to the Canadian Pacific Railway Company, who purposed erecting a large office or hotel building.

The railway company asked for competitive designs from different architects, and four sets of sketches were submitted from Montreal offices and one from a Toronto office. The designs submitted by Messrs. E. & W. S. Maxwell, of Montreal, have been accepted by the C. P. R. authorities, and the work of finishing up the plans will be proceeded with at once in order that tenders may be called as soon as possible for the construction of the building. The new structure will be devoted partly to offices for the Dominion Express Company, the C. P. R. Company and New York Central Railway, who will occupy the lower floor; while the upper storeys will be used for commercial offices. The building as designed will be ten storeys in height, and will be the skeleton steel frame type, fireproofed throughout. The estimated cost of this building is in the neighborhood of $400,000, and the officials expect to see its completion not later than December 1911. The new building will extend from St. James street to Fortification Lane. The property immediately back of the site is also owned by the Railway Company, but for the present nothing will be done in the way of constructing a new building on this later site, although it would not be surprising to learn that an hotel building would be erected there in the future.

Mr. E. M. Read, of the engineering department of the Canadian Pacific Railway, leaves this week for Vancouver to superintend work in the West for the company.

Building Inspector Alcide Chausse has requested the city authorities to add three assistant building inspectors to his present staff. He has also asked for the appointment of an inspector of fire escapes and elevators, and for two men to inspect all electric wiring.

Vancouver Correspondence

Gratifying Activity in Building Circles - Basic Prices of Building Materials — Unfair Railway Discrimination

Office of the Contract Record, Vancouver, B.C.
February 24th, 1910.

Vast as was the volume of last year's building operations, it was insufficient for the needs of this rapidly-growing city. Hundreds of new dwellings, scores of new business blocks, and a dozen or more large and modern office buildings, were erected, yet the demand remains unsatisfied, and consequently the building operations of the past twelve months must be duplicated upon a still more extensive scale. There is a great scarcity of dwellings, and hundreds of the new families arriving are compelled to lodge in small tenements and suites of three and four rooms—a mode of life that is both new and distasteful to them. The lack of homes has caused rents to soar out of all proportion to the service given, and has earned for the city the reputation of being an extremely dear place to live. It is hoped that by the end of the year this condition of affairs will have been remedied.

General Feeling of Prosperity.

Throughout the winter season building operations have been aerried forward on a scale hitherto unpredented in the wet season, and as a result the men of the different trades have had steady employment at god wages. This in itself has contributed in no small degree to the buoyant feeling of prosperity that is prevailing in every line of business.

While wooden homes continue to be erected as befitting the mild climate, the designs are tasteful and attractive, a considerable proportion being of the now popular California bungalow type, one and one-half storeys in height with dipped shingle exteriors, wide verandahs where the family spend most of their time in summer, and an interior with large reception hall, living room, dining room, den, and one or more fireplaces, in addition to bedrooms. These bungalows have cement basements with furnace and laundry, with stationary tubs and other modern conveniences. Some have the chimneys and verandah supports built of rough stone, the type admitting of much variety in architecture. Cement is now entering largely into construction work in Vancouver, and a number of the largest office buildings and business blocks recently erected represent the reinforced method.

The demand for brick became acute last year, owing to the large number of business blocks, warehouses and apartment houses under construction. The product of about half-a-dozen yards finds a market in the city, but the output is far below the requirements of contractors, and the bulk of the supply comes from Seattle, Wash. It is estimated that between 24,000,000 and 30,000,000 brick were used last season in Vancouver, in addition to a large quantity of the pressed article for facing purposes.

The use of wooden lath has fallen off greatly and hair or wood fibre is now taking the place of lime plaster. Four years ago only about 10 per cent. of the new wall covering was used—to-day the proportion is about 90 per cent., and increasing. Much of the immense quantity used by builders comes from the United States, being lower in price — although no better than the Winnipeg article, which is practically shut out of this large and growing market owing to the heavy freight charges. Practically the latter is only called for when there is a temporary scarcity of the competing article.

Patent roofings have been given a trial on large buildings, with unsatisfactory results, and the pitch and gravel kind is generally mentioned in the specifications for such. All dwellings are covered with shingles, applied in the green state. Very little hardwood flooring is used, fir being the favorite, owing to its cheapness, and lasting qualities.

Prices of Building Materials.

(Delivered on Job.)

Building paper, tarred, per roll, 90 cents.

Building paper, plain, per roll, 75 cents.

Bricks, common, per 1,000, $12.00.

Bricks, pressed, per 1,000, $40.00 to $62.00.

Cement, (Vancouver), per barrel, $3.20.

Roofing felt, per 100 pounds, $2.45.

Fire brick, (Scotch), per 1,000, $45.00.

Fire brick, small quantities, $48.00.

Lime, per barrel, $1.35.

Sewer pipe, per foot—4-in., 18 cents; 6-in., 33 cents.

Plaster of Paris, per ton, $18.50.

Putty, per pound, 5 cents.

Tar, 4-gallon tin, $1.25; per barrel, $6.75.

Hard wall plaster, per ton, $17.50.

Nails, base, $3.25.

Nails, cut, $4.00.

Mixed paint, gallon, $2.00; ½-gallon, $1.10; quart, 60 cents.

Boiled linseed oil, gallon, $1.20; barrel lots, per gallon, $1.00.

White lead, (genuine), 100 pounds, $8.50.

White lead, No. 1, per 100 pounds, $8.00.

Sash cord, per pound, 50 cents.

Sash weights, per 100 pounds, $3.00.

Tacoma hair fibre, per ton, $19.50.

Fire clay, per ton, $20.00.

Plate glass, (35 per cent. off local tariff).

Sheet glass, (10 per cent. off local tariff).

Expanded metal lath, (Hays'), 28 cents per square yard; Herringbone lath, 18 cents per square yard.

Ready roofing, (Sendor brand), ½-ply, $2.25; 1-ply, $2.65; 2-ply, $3.40.

Hexagon floor tiling, average 55 cents per square foot.

Wall tiling, average 95 cents per square foot.

Turpentine, per case, $8.60.

Rosin, per pound, 5 cents.

Elephant lead, per 100 pounds, $7.70.

Pig-iron, Etc.

Pig-iron, Eglinton No. 12, $24.75 per 2240 pounds, ex wharf, Vancouver.

Pig-lead, $90 per 2240 pounds, ex wharf, Vancouver.

Tin plate, I. C., 14 x 20, per box $3.50, ex wharf; Canada plates, local, $2.90; polished, $3.10.

Steel rails, 15-lb., $50 per 2240; 30-lb., $45 per 2240, ex wharf, Vancouver; 50-lb., $45 per 2240 pounds.

As will be readily understood, the demand for lumber of all kinds and shingles is enormous, and a number of the local sawmills are kept busy supplying the contractors, who likewise receive frequent shipments from Victoria, up-country and Coast points. The consumption last season was estimated at 10,000,000 feet per month this year it will be greater still.

More Competition Needed in Some Lines.

"You may take it for a fact," remarked a well known contractor, "that no line of business outside the wholesale hardware men is making the profits being chalked up by the sash and door men these days. The hardware men are arrogant in their prosperity, and it will be a real blessing when the new lines of railway bring about needed competition. One or two firms appear to imagine that even common courtesy is something that should be charged for, and some of the managers give away mighty little of it.''

Enormous quantities of cement, sand and gravel are required to supply the needs of the city contractors, and the supply frequently fails and causes a temporary stoppage of work. Last year the city council found itself unable to obtain a sufficient supply for the granolithic walks being built by day labor, and some miles had to be held over for this year. Until about five years ago, there were few, if any, concrete buildings in Vancouver; to-day they are numerous, while others are under way or projected. Concrete walks were first laid on residential streets about ten years ago, when the corporation decided to put down no wooden walks wider than three feet. As a result, property owners commenced petitioning for cement walks, the entire cost being charged up to them. To-day cement pavements are found on all the principal thoroughfares, the narrow wooden planks being confined mainly to the outskirts.

Unfair Railway Discrimination.

The Northwest provinces, including British Columbia, are crying out for industries to supply the needs of the large population already within their borders. The growth of existing concerns is hampered and prevented owing to the fact that the railway rates imposed will not permit of shipments to any considerable distance from the point of manufacture, while Eastern shippers appear to enjoy rates which permit them to undersell the Western manufacturer on his home ground. Here in Vancouver, our wholesale men, who enjoy cheap water freights on many of the lines handled, find it almost impossible to get a footing in Alberta owing to the high railway charges on their consignments, while most of the city industries and our dealers in builders' supplies cannot ship with any margin of profit beyond Kamloops. The situation is intolerable, and it is little wonder that the people of the prairie provinces and British Columbia are hopefully awaiting the completion of the Canadian Northern and Grand Trunk Pacific lines as likely to break the strength of the present monopoly and afford at least some measure of relief in freight rates.

The situation throughout the entire Northwest is well expressed in the following item which recently appeared in ''The Commercial,'' of Winnipeg, the well-known journal of the wholesale and retail trade:

> The matter of freight rates was brought to the attention of the Brandon council last week at its regular session by the Brandon Windmill & Pump Company. It was claimed by the company that a discrimination in freight rates is being shown in favor of the Eastern manufacturer against the Western manufacturer. The Brandon Windmill & Pump Company claimed that the difference in the rates made it impossible to compete with Eastern manufacturers in selling their products in British Columbia. The local company have written to the Board of Railway Commissioners protesting against the alleged discrimination, asking for the privilege of presenting their case before the Board at its first sitting in the West, and have also asked for the cooperation of the city council in fighting against the alleged injustice. A resolution was passed to ask the aid of the Board of Trade in the matter.
>
> The company claims that the freight rate from Woodstock, Ont., to Vancouver is $1.33 shipped in carload lots, and from Brandon to Vancouver the rate is $1.30, a difference of three cents from Woodstock to Brandon. The rate by local freight from Woodstock to Vancouver is $2.00, and from Brandon to Vancouver it is $1.92. The Brandon concern claims that the cost of manufacture is greater in the West than in the East, and that if such partial rates are to be given, the Brandon firm will be unable to sell its goods in British Columbia.

CITY AND COAST ITEMS OF INTEREST.

A new and handsome Y. M. C. A. building will in about eight months replace the present frame structure. The site has 70 feet on Blanchard street and 120 feet on View street.

Vancouver is to have a new Labor Temple to replace the present building on the corner of Dunsmuir and Homer streets The plans call for five storeys, including basement, the material to be of stone, steel and brick. The estimated cost is between $65,000 and $70,000. It is proposed to hold the dedication ceremonies next Labor Day, September 5th.

Work is to be started in a couple of weeks on the immense plant of the Sumner Iron Works in Burnaby municipality, about ten miles southeast of Vancouver, where a site comprising twenty acres has been secured. The present name of the station on the company's property is Ardley, but it is the intention of the company to move the depot 1,000 yards east and rename it Sumnerton, in honor of the founder of the Sumner Iron Works, at Everett, Wash.

A great steel plant, to cost between half a million and a million dollars, is to be established in the near future at a point on the Coast—probably on Vancouver Island—by James A. Moore, president of the Irondale Smelting Company, of Washington, in conjunction with other prominent capitalists. Extensive coal deposits have been acquired on Graham Island, one of the Queen Charlotte group, in addition to enormous ore bodies on Quatsino Sound and Atlin, in the interior, where a rich magnesite mine was lately discovered. The steel plant, which is expected to employ about 2,000 men, forms only part of Mr. Moore's extensive scheme. The Irondale Company expects to find a market along the entire northern Pacific coast, and also anticipates shipping its products to the Northwest, where there is a constantly growing market for structural steel and other lines to be manufactured.

The Wallace Shipyards, North Vancouver, have been awarded the contract for the construction of the new North Vancouver ferry, to cost $13,000. The vessel must be completed in six months' time.

Jens Orten-Boving & Company, hydraulic engineers, of London, England, have been awarded the contract to supply and erect 9,000 feet of pipe lines required by the Vancouver Island Power Company for its Jordan River plant for the supply of power to Victoria. The contract will figure out in excess of $80,000. Work is to be commenced immediately, as the pipe line must be completed by October 1st of the present year.

The Victoria building figures for January amounted to $128,985, an increase of 66 per cent. over the same month last year. Bank clearings for January aggregated $7,390,767, an increase of 75 per cent. over the corresponding month last year.

The lasting qualities of the creosoted paving blocks supplied to the city by the Dominion Carbolineum Works, Vancouver, received a convincing demonstration the other day, when it became necessary to open up Dupont street, which had been paved with the company's blocks nine years ago. Despite the heavy traffic to and from the wholesale houses and the C.P.R. and Great Northern freight sheds, the blocks were found to be practically as good as when first laid, the edges being sound and showing very little evidences of wear. All were relaid, and the street appears good for twenty years to come. In England they have taken up wooden blocks laid in 1895, which were in good condition, excepting that their edges were worn off. They have taken those blocks up, trimmed them off, and are using them again.

The engineers who will oversee the construction of the new Cambie street bridge, crossing False Creek, Vancouver, will receive a lump sum of $38,000. It sounds big, but the Granville street bridge experience went to show that the city would have been considerably ahead if the plan had been followed in that instance.

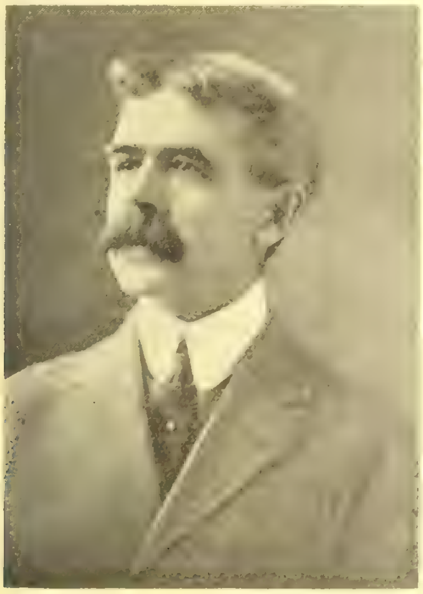
The Hudson's Bay Company's new stables, of reinforced concrete, are the first example of the Turner ''mushroom'' system in Western Canada. The building is also equipped with steel sash, which has only recently secured a footing in the West.

Work has been commenced on the Canada Life Assurance Company's new building on Hastings street, adjoining the handsome home of the Canadian Bank of Commerce. The building will be 44 by 120 feet, eight storeys high, absolutely fireproof with concrete floors. Carrara terra-cotta will adorn the Hastings street front, and pressed bricks the other sides. The Imperial Bank will occupy the ground floor.

Mr. Gillmor Brown, C. E.

Asst. Chief Engineer, Dept. of Public Works, Ottawa.

The subject of this sketch was born in Charlotte 'ounty, N.B., on September 25th, 1858. His education was obtained in various public schools and at the University of New Brunswick. Mr. Brown's professional :areer commenced in 1878. In this year and the follow ng he was engaged on the engineering staff of the Kent Northern Railway in New Brunswick. His next ex erience was obtained in 1880 and 1881 with the Inter olonial Railway. A year later he fulfilled the duties of ıssistant engineer of construction on the Short Line Railway in Nova Scotia. For the next two years he was ıssistant engineer in charge of construction on the Can ilever Railway Bridge across the St. John river at St. John, N.B. In 1885 he had charge of the Government short line surveys in New Brunswick. Upon the com letion of this work he accepted the position of chief ngineer on the steel truss railway bridge across the St. John river at Fredericton, N.B. The work occupied he better part of two years.



Mr. Gillmor Brown, C. E.

In October, 1889, Mr. Brown went to Wheeling, West Virginia, as engineer-in-charge of the Wheeling Bridge and Terminal Railway. Here he remained for period of four years. The work comprised a double rack steel railway bridge across the Ohio river. The structure had a total length of about 2,500 feet and a hannel span of 525 feet, which, at the time, was the ıeaviest span on the river. In addition, there were ıumerous other bridges of less importance, a steel via luct half a mile long, heavy retaining walls, and about mile of double track tunnelling. Mr. Brown's next osition was that of chief engineer of the Wheeling and Connellsville Railway survey. This was in 1893. In this year he became a senior member of the company of Brown & Hazlett, with head offices at Wheel ng, Va., The firm had a good connection in Western Virginia, Ohio and Kentucky, and carried out a large ımount of engineering work, including electric railway onstruction, structural steel work, surveys and reporting on railway bridges. In 1899 and 1900 Mr. Brown was chief engineer of the Camden system of electric railways and constructed the Parkersburg Electric Railway, the Ohio Valley Electric Railway, and the Camden Tri-State Electric Railway. In 1901 Mr. Brown returned to Canada and, as a member of the firm of Brown Brothers, was interested in the construction of the Beersville Railway, Kent County, N.B., and the reconstruction of the Central Railway. Six years later he was a member of the Commission appointed by the New Brunswick Government to examine and report on the branch railways of the province. In 1908 he was appointed resident engineer of the National Transcontinental Railway, and in March of the following year, division engineer on the same system. Mr. Brown was appointed to his present position in September, 1909.

A significant tribute to the abilities of Mr. Gillmor Brown was paid recently by the Hon. H. W. Emmerson, ex-Minister of Railways. Speaking from his seat in the House of Commons upon the question of the acquisition of branch railways by the Intercolonial, and referring to the report of the Commission, Mr. Emmerson said: "Mr. Brown is a civil engineer of practically an international reputation. . . . . He now holds a position in the Department of Public Works which he fills with credit to himself, to the Government which he serves and to those who had to do with his appointment."

Annual Banquet Winnipeg Builders' Exchange

Four hundred and fifty guests sat down to the annual banquet of the Winnipeg Builders' Exchange on the 21st ult. The enthusiasm at the function indicated a united front on the part of the master builders of Winnipeg.

President T. R. Deacon replied to the toast of the Winnipeg Builders' Exchange. After discussing at some length the work of the Exchange, Mr. Deacon dealt with the attitude of the public towards the builder. The speaker said that for a long time there had been a habit of looking upon the contractor as a man who made great profits and made them dishonestly. Mr. Deacon refuted the idea and said that he could at least speak for the Winnipeg section as to honesty. The absence of litigation in Winnipeg bulding circles attested to the truth of this statement. Touching upon the various efforts put forward by the unions, Mr. Deacon stated that if these associations continued to demand higher wages, the contractors would have to charge higher prices and the public pay the difference. Under such circumstances, rents would go up to prohibitive rates, rendering investments precarious and turning the flow of capital elsewhere.

Mayor Evans paid a tribute to the good work of the local Exheange and then referred briefly to the part of the builder in the construction of a city. "The larger, patriotic view," said Mr. Evans, "is what the builders of a city should have. If a man builds without regard to the city as a whole, he contributes his part to the creation of a jumble. If, however, he seeks to erect structures in harmony with some characteristic principle, he will be helping to give the city both beauty and distinction. The speaker concluded by asking the builders to erect structures this year to the extent of [illegible] dollars, a sentiment that was received with much enthusiasm.

Professor Brydone-Jack replied to the toast of "Our Guests," and dwelt briefly on the opportunities for builders in Western Canada. A congratulatory telegram was received from Mr. E. T. Nesbitt, president of the Canadian National Association of Builders.

Personal News and Notes

Mr. J. M. McIntyre has been elected to the directorate of the Dominion Bridge Company to fill the vacancy caused by the death of Mr. W. C. McIntyre.

Mr. Thos. Lewis, concrete manufacturer, Hamilton, Ont., was in attendance at the cement convention at Chicago last week.

City Engineer Jones, Brantford, Ont., returned recently from a holiday trip to Washington, Baltimore and Philadelphia.

City Engineer Speakman, Brandon, Man., has been elected a member of the American Society of Civil Engineers.

The estimated cost of engineering and construction work on the Panama canal was $139,000,000. It is stated that the actual cost will be $297,000,000.

City Clerk Littlejohn, of Toronto, who has been at Pinehurst, N.C., for five weeks, has left for Augustine, Fa. Mr. Littlejohn is on a two months' leave of absence owing to poor health.

Mr. Jas. Bell, city engineer of St. Thomas, Ont., has resigned. His resignation will take effect at the end of the year. Mr. Bell has occupied the position for more than a quarter of a century.

The annual meeting of the Ontario Good Roads Association is now being held in Toronto. The session opened on March 2nd and will close on March 4th. Mr. J. E. Farewell, of Whitby, Ont., is secretary.

At the annual meeting of the Granite Cutters' Union, Toronto, the following officers were elected: President, Wm. Nettleship; vice-president, Geo. Ray; secretary, Jas. Sevenright; treasurer, A. Dundas.

The British Columbia estimates for the current year are seven and three-quarter millions, compared with about four and a half millions last year. The main increase is for roads, bridges and wharves.

At a recent meeting of the Board of Trade of St. John, N.B., a resolution was passed asking similar bodies in the province to solicit the government to call a Good Roads' Convention during the coming session of the legislature.

Mr. J. V. Gray and Mr. A. F. Wells, formerly of the Bishop Construction Company, have opened offices in the Confederation Life Building, Toronto, to carry on a general engineering and contracting business under the name of Wells & Gray, Limited.

There was a record attendance at the annual banquet of the Winnipeg Builders' Exchange, held at Manitoba Hall, Winnipeg, on February 21st. The success which attended this convention reflected much credit upon the enterprising secretary, Mr. Thos. Buxton, Jr.

Mr. W. M. Somervell, architect, of Seattle, Washington, has opened a branch office at Vancouver, at 43 Exchange Building. Mr. J. L. Putnam, formerly associated with Messrs. Carpenter & Blair, New York City, is in charge. Plans are now being prepared in this office for a modern eight-storey commercial building to be erected at Vancouver.

The Toronto unions of the Amalgamated Society of Carpenters and Joiners are making arrangements to celebrate the jubilee of the organization on July 1st. The Toronto festivities will take the form of a big demonstration and picnic at Niagara Falls. All the unions in the city and province, as well as those of Buffalo and Western New York, will participate. The Society was formed in England in June, 1860.

The new schools' architect at Vancouver, B.C., is Mr. W. A. Leech, a medallist of King's College, London. Mr. Leech has been a resident of Vancouver for sixteen years, but formerly he lectured with much success upon architecture and engineering at technical institutes in England and South Africa. He is a member of the Architectural Society of London.

At the annual meeting of the Alberta Association of Architects held recently, the election of officers for the ensuing year resulted as follows: President, E. C. Hopkins, Edmonton; 1st vice-president, J. A. MacDonald, Lethbridge; 2nd vice-president, F. J. Lawson, Calgary; secretary, H. M. Whiddington, Strathcona; treasurer, C. L. Gibbs, Edmonton; council, R. Percy Barnes (Edmonton), Jas. Henderson (Edmonton), H. D. Johnson (Edmonton), R. W. Lines (Edmonton), J. E. Wize (Edmonton), G. Fordyce (Calgary).

Messrs. Haney & Miller, the contractors who constructed the water tunnel across the Toronto bay, have asked the Board of Control to release their bond of $150,000, which is in a guarantee company. The city solicitor opposes this and says that if the conditions of the bond have been carried out satisfactorily the bond is null without being released. In other words, while the city is unable, after a lapse of over a year, to complain of the manner in which the work was carried out, they wish to be safeguarded against the contractors in case of an upheaval or some unforeseen development over which they will have no control.

Coming Cement Show at London, Ont.

The Second Annual Cement Show, which is to be held at London, Ont., from March 29th to April 1st, under the auspices of the Canadian Cement and Concrete Association, promises to be a most successful and representative exhibition. Applications for space have been pouring in to the manager, Mr. A. M. Hunt, of 425 Richmond street, London, Ont. The first allotments were made on Febraury 28th. The remaining space will be allotted in order of application. Goods intended for exhibition must be plainly marked with the name of the exhibitor, number of space, and addressed to the Princess Rink, London, Ont. The show will be open to the public on Tuesday, March 29th, at 9 a.m. and each day thereafter at the same hour, closing in the evening at 10.30 p.m. Further particulars concerning exhibits may be obtained on application to Mr. Hunt.

We have received from the publishers, Messrs. John Wiley & Sons, New York, an excellent treatise entitled "The Water Supply, Sewerage and Plumbing of Modern City Buildings," by Wm. Paul Gerhard, C.E. Mr. Gerhard is the author of so many excellent technical works that any introduction at our hands would be superfluous. Suffice it to say that the various phases of the subject are treated in a most exhaustive and thorough manner. A great many special illustrations, drawn largely from the author's practice, and some interesting hydraulic tables and daigrams add considerably to the value of the work. There are 491 pages, 214 text illustrations, 15 tables and 25 diagrams. Price, cloth, $4 net.

Building permits issued at Belleville, Ont., during 1909 totalled $221,000. The amount spent on residences was $100,000. The largest building was the Catholic school, costing $60,000.

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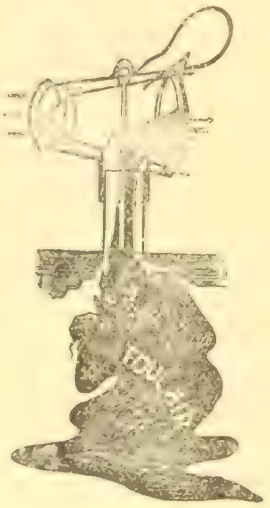

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Strides Made in Construction

To the ordinary individual who is not directly interested in the scientific construction of buildings, it would indeed be surprising to get an idea of the advancement that has been made in the past ten years.

The methods of interior construction moderately built and fireproof structures in great cities have been completely revolutionized in the last decade. Ten years ago the so-called modern office buildings of the day were built with interior construction of highly inflammable material. Ceilings and walls of wood made every room veritable tinder boxes—firewood over which flames could mount inexorably and with a rapidity that made such offices a constant source of menace to tenants. To-day no sane architect would dream of employing these dangerous products for such purposes. The modern structure of the present day is invariably built with every floor composed of concrete slabs spanning from beam to beam—and even these steel beams are thoroughly enveloped in concrete that they may be effectually protected from possible expansion or contraction through heat or cold.

Nor are the partitions of the modern building composed of wood joists and laths. Up-to-date construction calls either for concrete blocks or sheet steel joists or studs. When an architect starts to plan a building to-day, he figures first on the dead weight of the building, and, secondly, on the live load each floor is to carry. On these two problems and their results depends the nature of the material he will employ. But it frequently happens that when an architect is first retained to superintend the construction of a building—and even when the contract is let—the subdividing of each floor is left in abeyance pending the disposition of probable tenants. When a building is finaly subdivided under such circumstances as these, the sheet studding and expanded metal lathing partitions are usually much to be preferred owing to the vast difference of this type and others. These partitions are either hollow or solid, the former being preferred where sound-proof partitions are desired. But when the architect desires to use every inch of space at his disposal, he chooses solid partitions not over 2½ inches, or not less than 1½ inches thick. These partitions are built by erecting T-shaped studs running from floor to ceiling at 12-inch centres, and to these applying extended metal lathing on one side only. The plasterer then puts on material to lath and when this surface has set, he applies the plaster to the key on the opposite side and an absolutely rigidity is assured.

So great has been the evolution in both modern methods and materials that not only have insurance companies recognized the merits of these up-to-date ideas, but different civic corporations themselves have passed building by-laws which make it imperative that at least the dividing walls in office buildings, apartment houses, etc., must be of incombustible and fire-resisting material. The use of expanded metal lathing and its preference over old wooden laths is probably one of the most apparent of any of the changes that have taken place.

Expanded metal lathing is in great demand to-day. The Pedlar People, of Oshawa, for instance, claim to be manufacturing an amount greater than the output of any other twenty wooden lath mills in the country. The daily output of this concern's factories exceeds ten thousand square yards.

Permits issued at Toronto last month represented a total of $682,088, compared with $380,025 for January, 1909.

A strong evidence of Vancouver's growth is afforded in the decision of the C. P. R. Company to double the capacity of the Hotel Vancouver. The work will be proceeded with in such a manner as not to interfere with business, which is very heavy in the summer season. When completed, five years hence, the hotel will have 600 rooms, and in appearance and richness of interior fittings will be one of the finest hostelries in Canada. The additions and alterations will cost a large sum.

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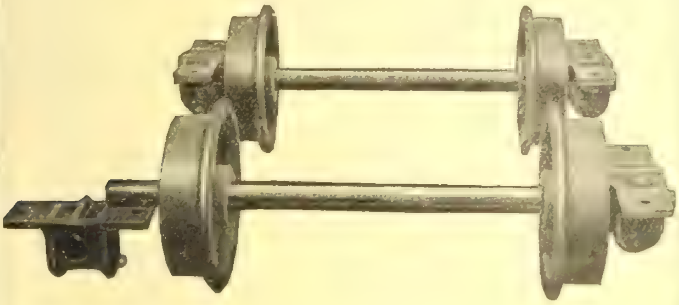

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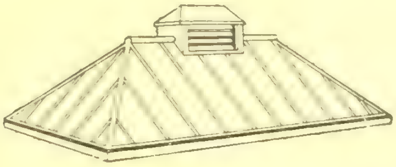

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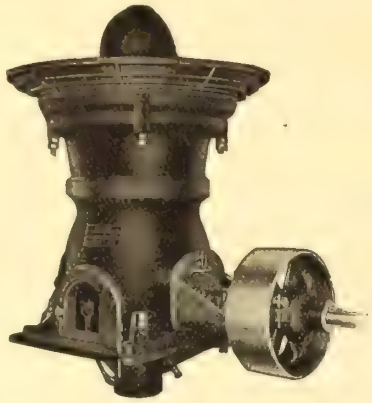

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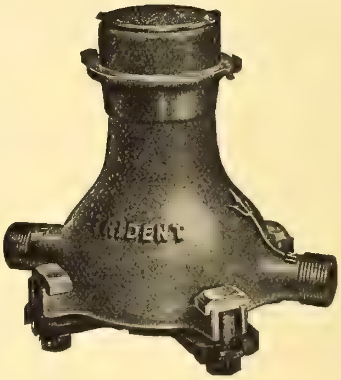

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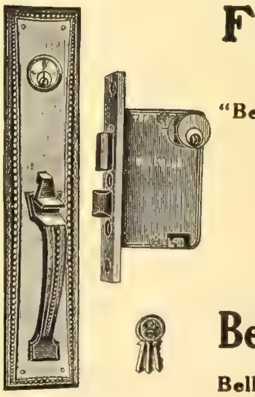

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Equal to natural stone in Appearance and Durability at a much lower price

Write Us for Particulars

The Cement Products Co.

Union Bank Chambers, 19 Wellington St. West
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Sackville Freestone Co.

Sackville, N. B.

Block Stone Shoddy Dimension

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

PORTLAND CEMENT

Sewer Pipes

Fire Bricks

Fire Clay

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Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
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Phone Main 4516

Head Office :
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Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

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Dundas Stone

All Sizes—For Concrete Road-work and Sidewalks.

Doolittle & Wilcox, Limited

Dundas - Ontario

Corinthian Stone

is made of **stone**: **is** of the **same material** from **face** to **back**: **can** be **cut** or **carved** similar to natural stone; is **specified** by **leading Architects**. **For prices** for all kinds of Ornamental Work, Sills, Heads, Ashler, etc., write

THE CORINTHIAN STONE CO.

Who are the Sole Manufacturers of "Corinthian Stone"

Office and Works - - **G.T.R. Junction, Guelph, Canada**

"Judge a Cement by its Works."

Sold under a **guarantee** other portlands cannot make in **good faith**. That guarantee is backed by the **oldest** and most **responsible manufacturers in the world.**

AMERICAN

CEMENT
ALSEN
45 BROADWAY, NEW YORK.

Selected for **PANAMA CANAL** in Preference at Equal Prices and has exceeded those severe requirements.

GERMAN

Alsen's has now been awarded the largest contract ever let for one brand of cement which specifies 1,100,000 barrels of Portland, the Ashokan Dam, New York State.

The best color and most **durable for cement blocks and sidewalks.**

Write for list of other important works in all sections [illegible]

MEANS

Strength, Durability and Efficiency

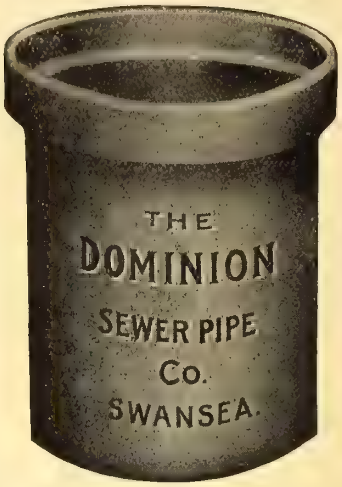
All sizes 3 inches to 36 inches single and double strength

Write for catalogue "C" showing our range of **Sewer Pipe, Fire Brick, Wall Coping, Flue Liners, Chimney Tops.**

We quote F. O. B. your town.

The
Toronto Pottery Co., Limited
TORONTO, CANADA
Canadian Branch of the Robinson Clay Product Co., Akron, O.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

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- **Flue Linings**
- **Wall Coping**
- **Culvert Pipe**
- **Inverts**

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PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Sewer and Culvert Pipes

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

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Standard Drain Pipe Co.
Factories:
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Sewer Pipe
Single and Double. Strength, 3″ to 36″

Clay Conduits
Single and Multiple

Samples furnished on request.

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Why Not Now?

Made in Canada's largest and most modern Sewer Pipe Plant.

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Investigate?

The Hamilton & Toronto Sewer Pipe Co., Limited
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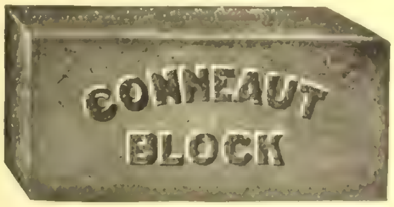

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WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
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SIEMON BROS. Limited
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CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

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Majestic Coal or Wood Chutes

No modern residence or public building is now complete without a Coal or Wood Chute.

It replaces the ordinary cellar window which is generally used to receive the coal or wood, and thereby does away with the annoyance of broken windows, badly disfigured or probably totally destroyed window frames.

The door when open locks itself automatically, and furnishes a protection to the building above the fuel opening, and when closed it is positively burglar proof.

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Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

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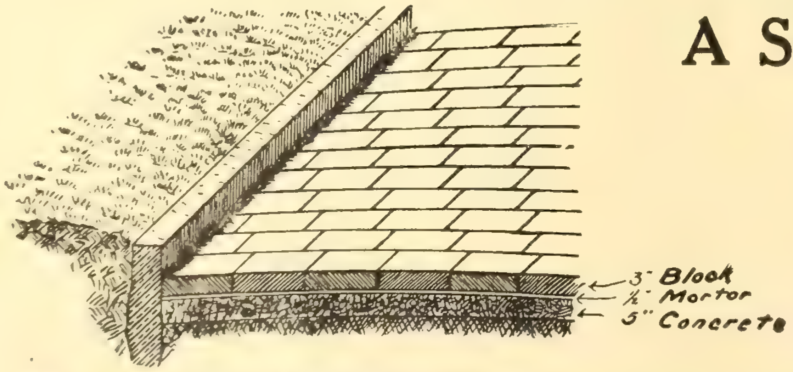

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These Requirements are Met by
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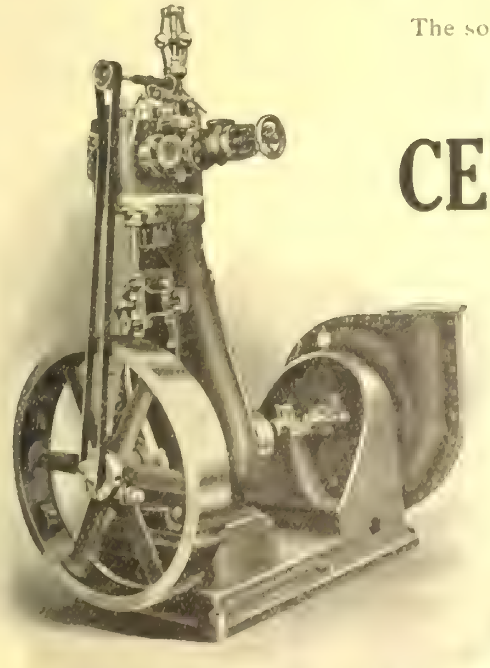

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make them the ideal installation where heavy and continuous work is required.

Just the thing for **Sand Dredging, Cofferdam and General Contracting Work** where the pumps are to be left in charge of unskilled labor.

The split base construction allows all working parts to be lifted bodily from the base without disturbing the foundation. Of special benefit when pump is set in concrete or the sectional flange is placed close to the wall where access is difficult. Packing gland is split and permits easy overhauling of the packing. No restricted water passages to clog up. No valves or eccentrics to get out of order.

Start them going and they will run till the whistle blows

Bulletin No. 200 On Request

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GALT - ONTARIO
Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, for foundation work..	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b. with 30 and 5 per cent. off for wholesale:—

	Star	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7.25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, any color, ¾-in. square, 1-in. hex. and 3-16-in. round, 35 cents per square foot up.
Floor Tile—½-inch square, 45 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 35 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish, colors, firsts, 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G. cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Brass Goods, Valves, etc.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.
Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.
No. 4 compression bath cock........net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Furnaces, 45 per cent.; registers, 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.; other specials, 40 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00

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Consulting and Supervising Engineers
Municipal Lighting, Water and Sewerage Work
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Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
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"TAMCO" Crushed Stone in all sizes, for all purposes.
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"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
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Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
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Cast Iron Sinks.

16 x 24, $1; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 27½ per cent. off.; lead waste, 27½ per cent. off; caulking lead, 4½ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 70; malleable bushings, 67½; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 67½ per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.

7 and 8-inch pipe, 40 per cent.

Light pipe, 60 per cent.; fittings, 70 per cent.

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Cement, barrel lots in bags, delivered, Toronto, bags extra, $1.70.

Cement, wholesale lots of 1,000 barrels, f.o.b. Toronto, $1.30.

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Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $13.50 to $15 per toise.

Free stone, delivered, $13.50 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.20 to $1.25 per ton.

Scotch fire brick, delivered, $30 to $35 per thousand.

Steel channels and beams, $2.75 per 100 pounds, delivered.

Lime, per cwt., delivered, 38 cents.

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plasters, $5.50 per ton.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $7.50 to $8.00 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.

Pure Green Seal Zinc White, ground in oil, $12.50 to $13.00 per 100 lbs.

Boiled Linseed Oil, in barrels, 78 cents per gallon of 9 lbs.

Raw Linseed Oil, in barrels, 75 cents per gallon of 9 lbs.

Turpentine, in barrels, 80 cents per gallon of 8 4-10 lbs.

Pure Linseed Oil Putty, 25-lb. tins, $3.25 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $2.75 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

[illegible] [illegible] & [illegible], contractors, Quebec, Que., have registered.

B. [illegible], builder and proprietor of planing mill, is advertising business for sale.

According to the Manitoba Gazette ,application for the following acts will be made at the next session of the [illegible] Legislature: To incorporate the Winnipeg Steam Heating Company, for the purpose of carrying on a steam heating and power business; to ratify the amalgamation between the Winnipeg Power Company and the Winnipeg Street Railway Company, and between the Winnipeg Electric Railway Company, the Manitoba Electric & Gas Light Company, the Northwest Electric Company, and other companies, and vesting the franchises and assets of [illegible] in the Winnipeg Electric Railway Company.

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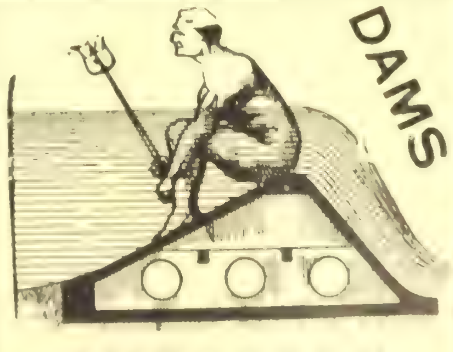

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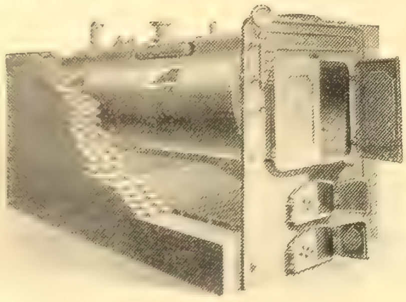

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are invited to get our quotations on Wire Reinforcing. We are operating the largest and oldest wire goods plant in Canada. Our

Wire Reinforcings

are made in all strengths of material and in any lengths required. They have been declared especially desirable on floor and roof work. *Write for Catalogue No. 5*

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For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material: best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

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DB SKYLIGHTS

Positively free from such faults as leaking, sweating or dripping.

Insure greatest light and durability with least possible weight.

Made of either copper or galvanized iron. All parts are standardized.

Unlimited Sizes. Estimates given.

Douglas Brothers, Limited

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Gang Saws!

See the

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The **Saw** that **cuts** down **cost** as well as **Stone.**

Greater cutting capacity with less power than any other Gang on the market.

If interested, drop me a line

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ALL SIZES

For Steam, Gas, Oil and Water

Standard Flanged Fittings

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For 125 or 250 pounds working pressure.

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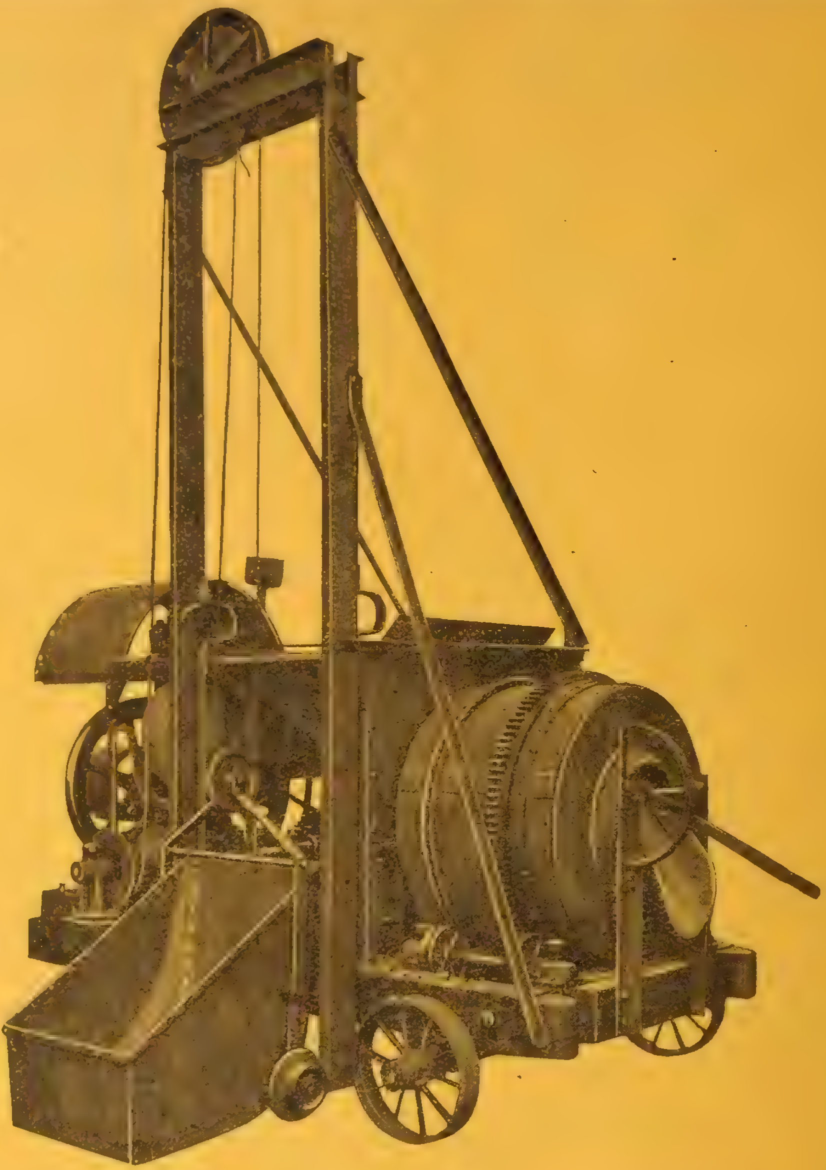

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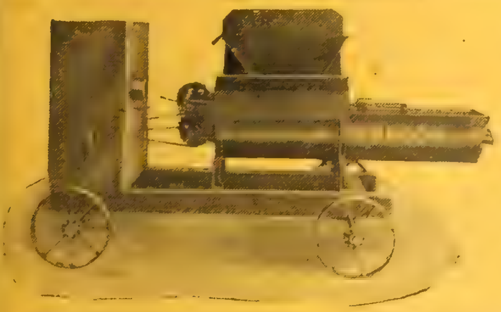

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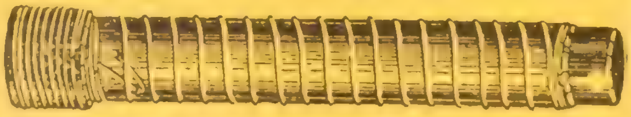

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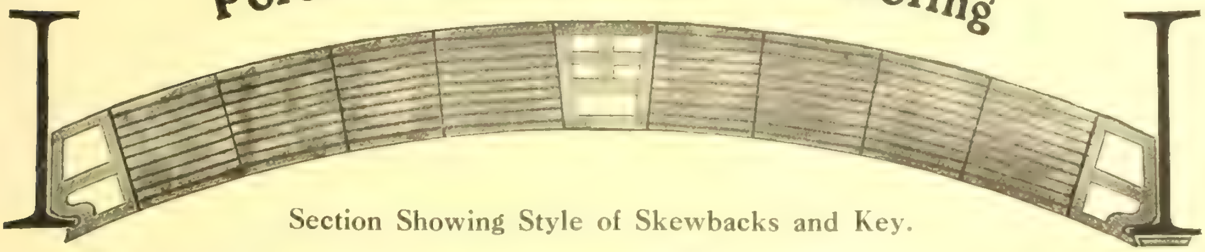

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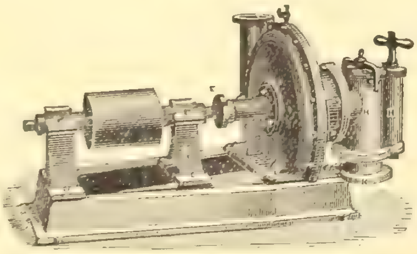

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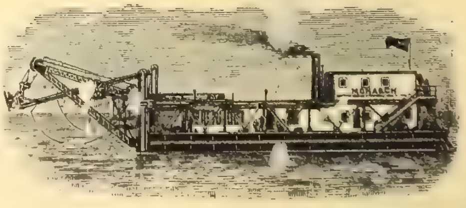

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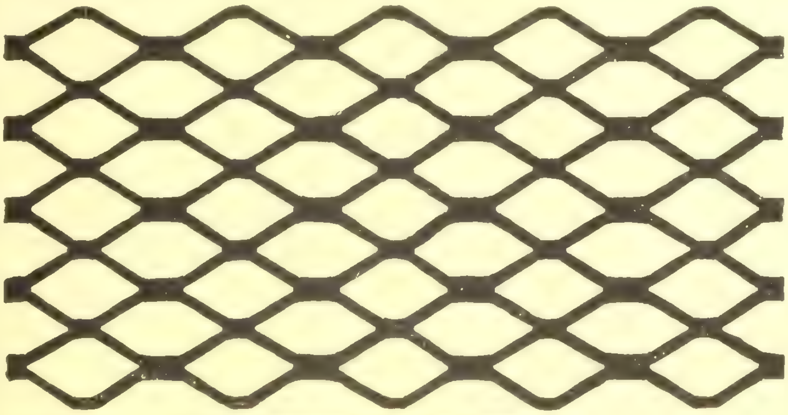

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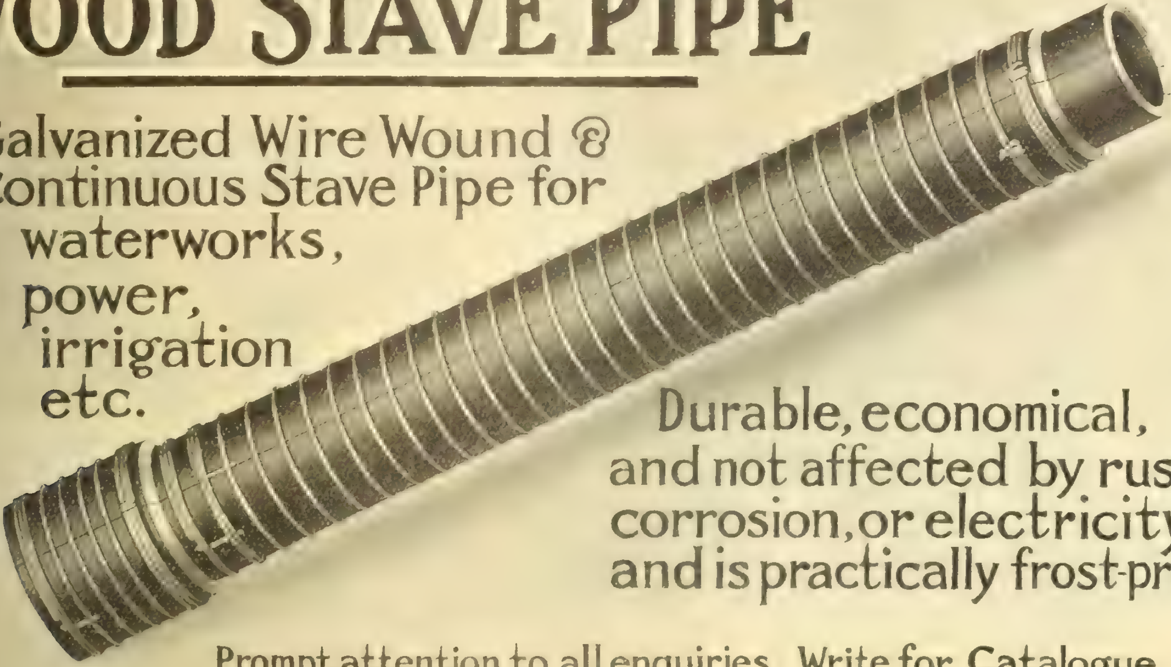

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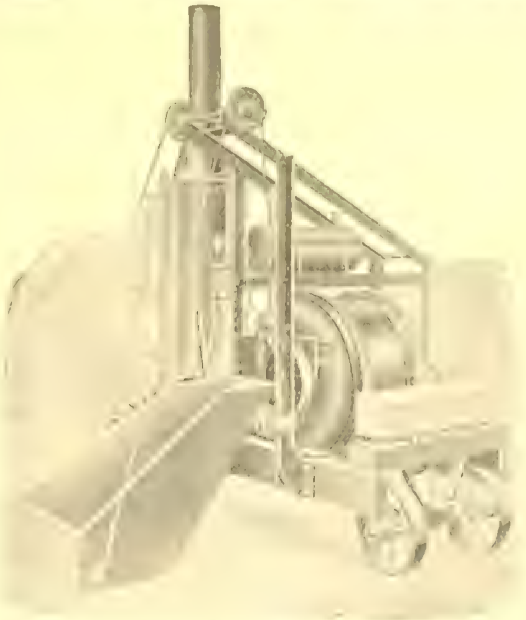

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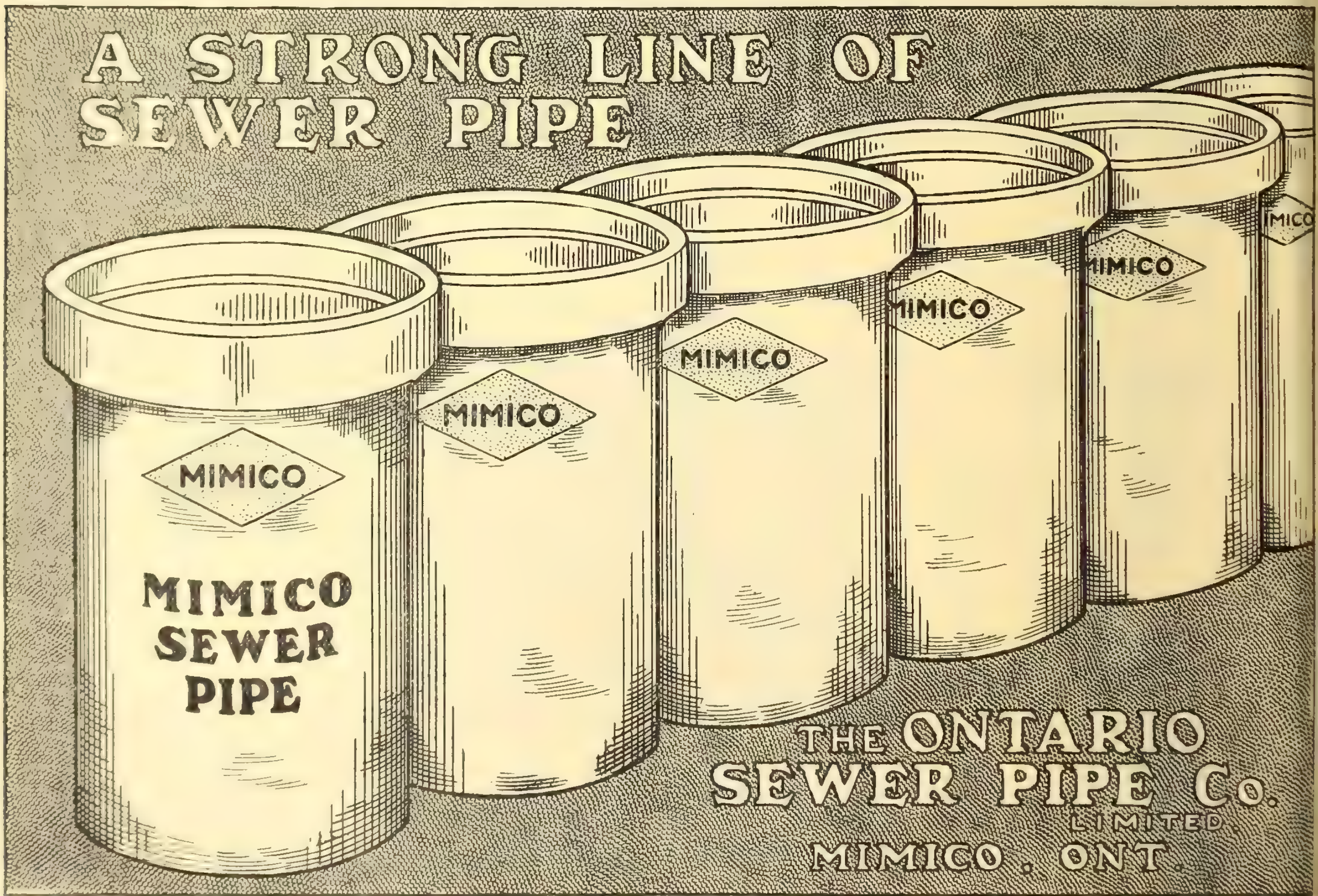

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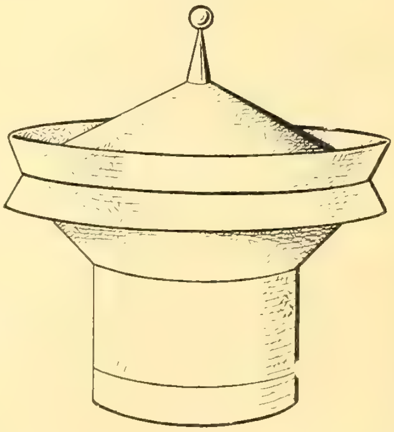

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No matter how strong the wind there is no possibility of a down draft. Instead the slightest breath of air will draw up; or exhaust, the foul air in the building.

No damper is needed with this ventilator, and it is always at work.

For removing heat and odors from factories, foundries, round houses and stores the "Acorn" Exhaust Ventilator is unequalled.

Builders and contractors who have tested the "Acorn" Exhaust Ventilator unhesitatingly recommend it. If you are not familiar with this newest and best ventilator write us for complete information. We want every builder and contractor to know all about it.

We also make several other styles of ventilators. Get our prices. They will interest you.

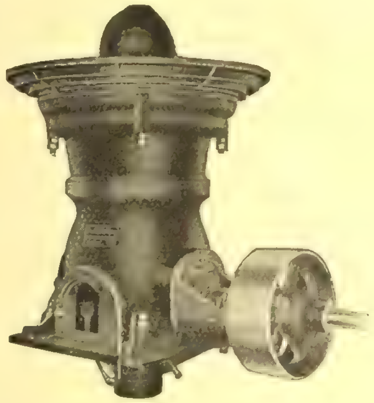
Metal Shingle and Siding Co., Limited

Branch Office and Factory, Montreal, P.Q. **Preston, Ont.**

ORNAMENTAL IRON WORK

Wire Work, Reinforcement for Cement, Etc.

The Geo. B. Meadows Toronto Wire, Iron & Brass Works Co., Limited
479 Wellington Street, West Toronto



Are you interested in Crushers?
Do you know about the famous

McCully Crusher

Investigate a little bit. You'll find the subject interesting, and will want to know more. Begin to-day.

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Power & Mining Machinery Co.
Cudahy, Wis.
New York Office: 115 Broadway.
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Neptune Meter Company

Manufacturers of the Well-known

TRIDENT Frost-Proof Water Meters

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Renfrew Lime

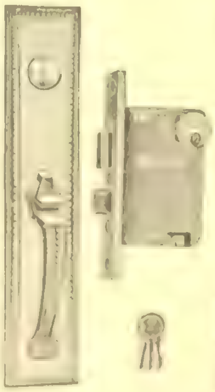
Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time to temper the mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.



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You may have mailed free to you today a catalogue of the

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This book has been made especially for the use of Architects.

The "Belleville" brand of Builders' Hardware is of such excellent design and finish that [illegible] in this catalogue.

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of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

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The Canadian Bridge Company, Limited

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Estimates furnished on application.

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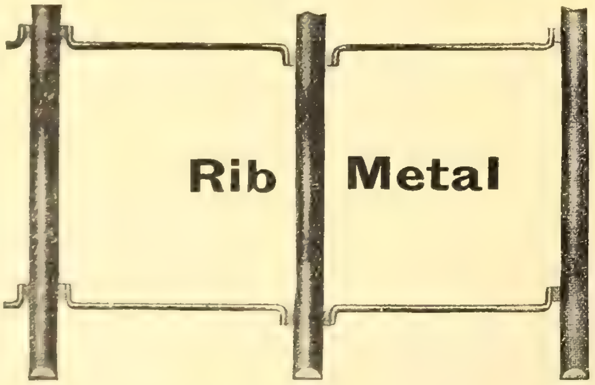
of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.



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Efficient. Easily handled.

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Established 40 Years **Office, HAMILTON CANADA** **Capacity 25,000 Tons per annum**

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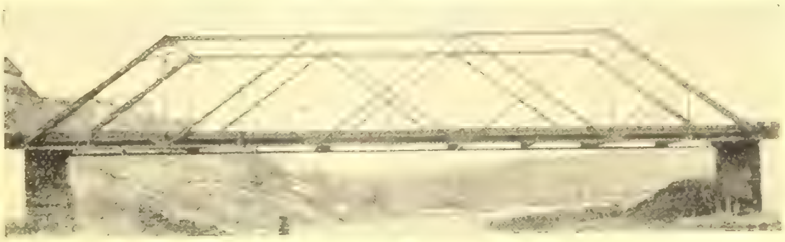

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Pine and Oak
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Interior Woodwork of Superior Quality
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Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

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SPECIFICATIONS SOLICITED

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Suitable for Sprinkler Systems
Fire Protection, Water Supply
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Steel Substructures of all kinds
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Showing construction of Mail Job Printing Co's. building, cor. Adelaide and Duncan Streets, Toronto. Leach Concrete Co., Contractors.
We are contractors for Stable Floors, Tanks and
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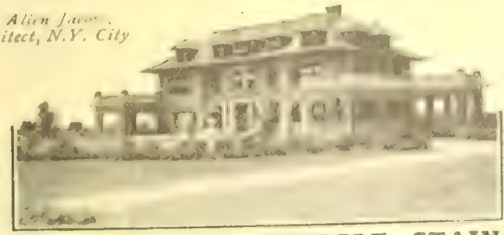
*Harry Allen Jacobs,
Architect, N.Y. City*



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For shingles, siding and other exterior woodwork.
Cabot's Sheathing and Deafening Quilt.
The warmest sheathing and the perfect [illegible]
Waterproof Cement and Brick Stains, [illegible]

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GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

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We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

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are made in brass and iron, have full area when open and are tight when closed. Latest designs and tastefully painted.

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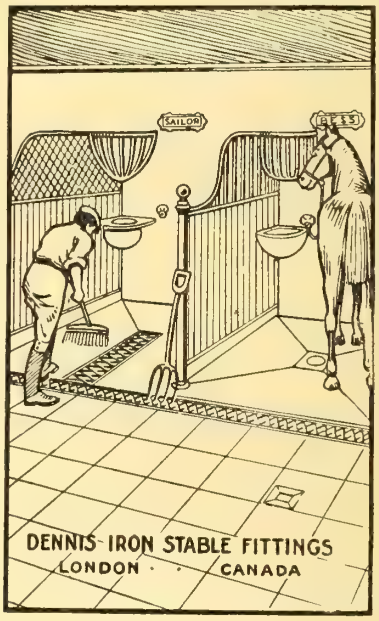
WALKERVILLE, Ontario

The Modern Stable



Our Iron Stable Fittings give the stable a modern attractive appearance, make it wholesome and sanitary—and they never wear out.

We make a special feature of this line and quote prices that make it possible to furnish a stable in a complete and up-to-date way at a very moderate cost.

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Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

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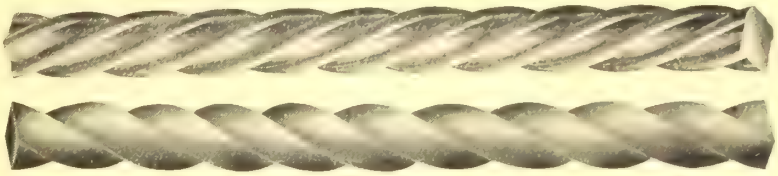
Steel Bars for Reinforcing Concrete

Plain Round, Square Flat, Twisted and Spiral Bars. Channels for Fireproofing

Squares and
Rounds
3-8 in. to
1 1-4 in.

Elastic Limit
50,000 lbs.
or Higher



HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate
Shipment
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Cut to
Required
Lengths

BUFFALO STEEL CO., Tonawanda, N. Y. "Suburb of Buffalo, N.Y.

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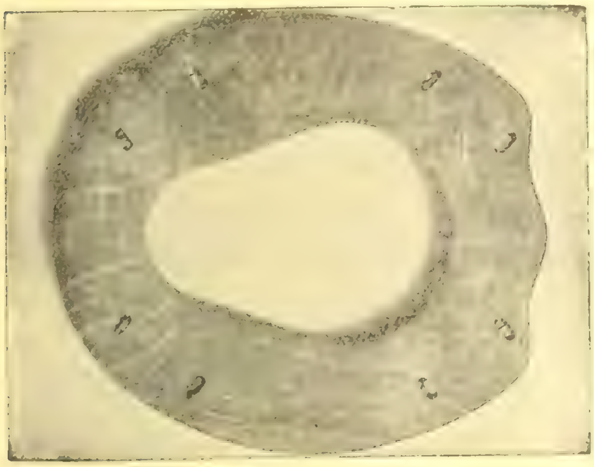
"Never Split" Closet Seat

The superiority of this seat over all others is so evident, architects and builders who have their reputation and clients' interests at heart should specify and insist on the "Never Split" seat being a part of every closet combination they install.



Made on scientific principles and combining Greatest Strength, Rigidity and Sanitary Value. Have no equal for fine appearance and lasting qualities. In addition to the tongue, groove and glue of the ordinary seat each joint of the "Never Split" is Steel Bolted making them absolutely impossible of splitting, warping or cracking. Guaranteed to give fullest satisfaction. Get full particulars—its worth while—write to-day

Goderich Organ Co., Limited Goderich
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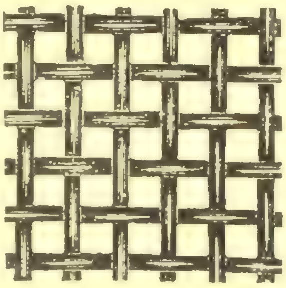
Canada Wire Goods Mfg. Co.

Hamilton



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Double Crimped Wire Cloth and Wire Screening

for all purposes of Steel, Iron, Brass, Copper, Bronze, Galvanized and Tinned Wire, etc.

There is no kind of Wire Fabric required in the production of any machine or manufactured article that we cannot furnish.

—We also manufacture—

Bank and Office Grilles and Ornamental Iron Work in all finishes

Jail and Prison Metal Construction, Wire Lockers, Riddles, Laboratory Testing Sieves and General Wire Work of every description.

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Inquiries solicited

The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

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Limited

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Port Credit Brick

Is the leading building material of today because of the strength, color and quality. We make the following :

Repressed Wire Cut Brick
Common Wire Cut Brick
Pressed Brick
Paving Brick

Our prices will interest you.

Port Credit Brick Co.
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Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

Crushed Stone Dimension and Coursing Stone, Lime :: ::

Firebrick and Clay, Sewer Pipe, Weeping Tile, Bricks, Mortar. Mortar Color, Damp Course, Wheelbarrows, Hose, Soot Doors,

Ivory and Cement Plaster

Fireproofing, Expanded Metal, Steel Beams, Columns, Wire and Manilla Rope, etc., etc.

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75 Brock Ave., Jarvis Street Wharf,
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The Contractors Supply Co., Limited
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Dry Pressed Brick

The Dry Pressed Brick is the most artistic up-to-date permanent building material on the market. Architects and Contractors agree on this. We are manufacturing best colored, most uniform Brick on the market.

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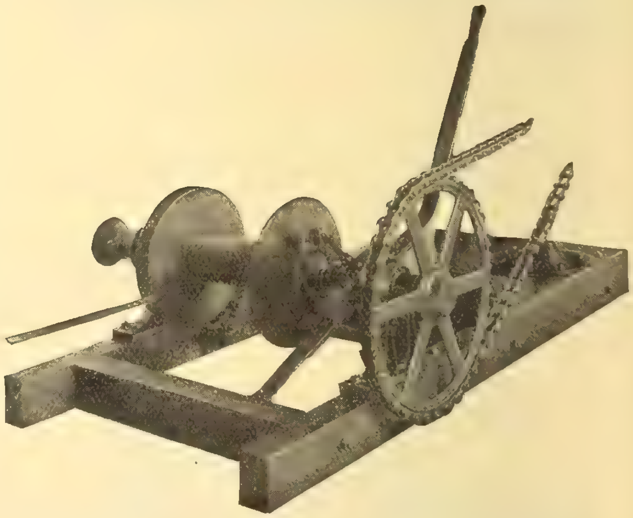
"London" Friction Clutch Hoist



We have designed and perfected a hoist that would meet the demand for a simple and durable hoist at a moderable cost. The "London" is a powerful hoist for use with any style of Gas, Gasoline or Oil Engine.

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Engineers and Machinists **London, Canada**

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Contractors for
Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

Roman Stone

is the oldest and yet the most modern building material. It was used in important old Roman work and is being used in many up-to-date buildings to-day.

ROMAN STONE is made from pure white marble and machine tooled after casting.

Any Size, Shape and color

The Roman Stone Co.
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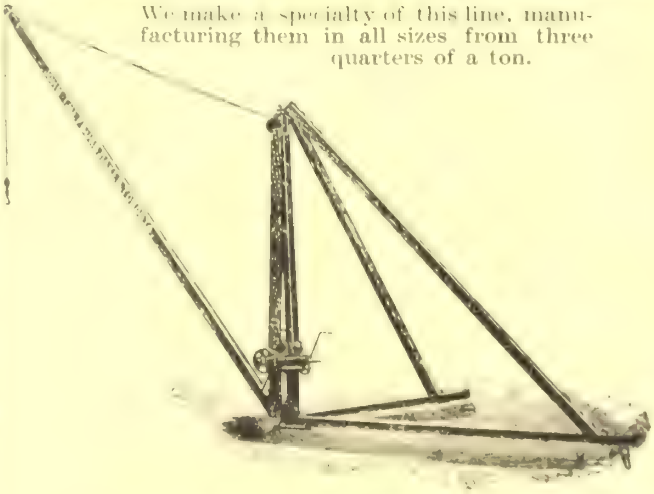
100 Marlborough Avenue - Toronto

Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



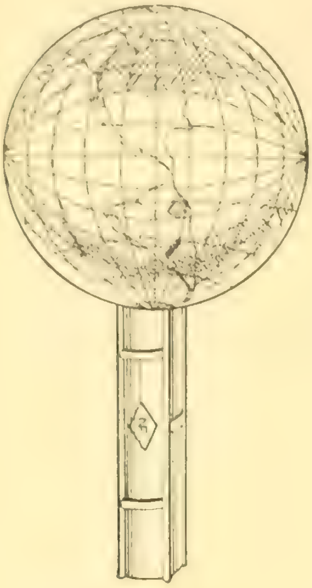
Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the Little Wonder Cement Block Machine and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds
Prices on application

JOHN T. HEPBURN
18-34 Van Horne St., Toronto, Canada

The Strength is in the Steel



Registered under the Trade Mark and Designs Act.

"NF" Reinforcing Bar for Concrete

is all made from **Bottom Cast** Open Hearth Steel which we make OURSELVES.

Each heat or drawing of metal is tested by chemical analysis to insure its hardness. The ingots are then rolled, and after rolling are subjected to **tensile tests.**

Any heat which does not show the requisite **tensile strength, elastic limit, elongation** and correct **reduction of area** is rejected by us.

The material for **most** concrete bars is too often simply **off heats** of steel which cannot be used for a better purpose.

If there is any definite value in the system of concrete reinforcement one of whose two bases is a **reinforcing metal,** OUR method is the only RELIABLE one.

It's a simple enough fact but worth bearing in mind in making up specifications that the STRENGTH is in THE STEEL, and that "NF" REINFORCING BAR has the STRENGTH because it has the STEEL.

ONTARIO IRON & STEEL COMPANY, LIMITED
Toronto, Ont., Canada

We Manufacture

Frames - Sash - Doors
House Trim

Finest Quality Hardwood Flooring
High Class Interior Work :: ::

OUR ARGUMENTS FOR SOLICITING YOUR BUSINESS ARE EXCELLENT.

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity.
New and well equipped factory with latest and best machinery.
Experienced workmen under the most expert supervision. ::

GIVE US A TRIAL ORDER OUR WORK WILL CONVINCE YOU

Georgian Bay Shook Mills, Limited
Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Arcola, Sask.
The municipal council are having plans prepared for extensions to the water supply of siphoning from the present source to the town.

Fort Erie, Out.
The ratepayers will vote on a bylaw to issue $50,000 30-year 5 per cent. waterworks debentures. B. F. Matthews, clerk.

High River, Alta.
This municipality will apply to the provincial government for power to borrow $125,000, required for the construction of waterworks and sewerage systems. Noted in issue of January 5th.

Hamilton, Ont.
In City Engineer Macallum's report the total cost of the sewers required in the east end annex appear as $160,000. Of this $110,000 will be required immediately.

Kildonan, Man.
The council have passed bylaws providing for the issue of $3,036.97 sidewalk debentures. F. Munroe, clerk.

Nanaimo, B.C.
A bylaw authorizing the council to borrow $12,000 for the construction of a cement dam at No. 1 reservoir will be submitted to the ratepayers at an early date.

Ottawa, Ont.
The following tenders were received for the supply of 3,000 lineal feet of 42-inch steel intake pipe: East Jersey Pipe Company, Lockbar (Laurin & Leitch), $29,760; Marsh & Henthorn, Belleville, $21,400; Toronto Iron Works, Limited, Toronto, $22,683; Canada Foundry Company, Toronto, $21,500; Wm. Hamilton, Peterboro, $19,815; Laurin & Leitch, Montreal, $30,660; Chaudiere Machine Company, Ottawa, $31,657; Gerald Lomer, Montreal, $25,000; T. S. Kirby Company, Ottawa, $19,998; Jenckes Machine Company, St. Catharines, $31,500; W. Beverley Robinson, Montreal, $19,953.33; Hyde & Webster, Montreal, $20,947.40; John Inglis & Company, Toronto, $23,900; Western Bridge & Equipment Company, Chatham, Ont., $21,965; Power & Company, Ottawa, $19,492; J. Coates & Company, Ottawa, $21,000. Noted in issue of February 23rd.

Port Dalhousie, Ont.
The plan of the scheme for construction of waterworks which the council is considering is at Mr. Waugh's.

St. John, N.B.
F. W. Murdock, city engineer, has been instructed to prepare plans and estimates of cost for the renewal of pipes in the distribution system where such renewal is urgent. He will also prepare a report on the matter of additional hydrants.

Vancouver, B.C.
Tenders will be invited for the construction of five miles of concrete walks. W. A. Clement, city engineer.

Winnipeg, Man.
Tenders addressed to the Chairman of the Board of Control will be received until April 4th for supply of quantity of cast iron water pipe, valves and hydrants for extension of the waterworks system. Specifications, etc., at office of City Engineer, M. Peterson, secretary.

AWARDED.

Edmonton, Alta.
A. Butchart, water commissioner sends us a list of the following tenders: Brass Goods — Ross Bros., Edmonton, $3,021.37;* Standard Plumbing & Heating Company, Edmonton; Gorman, Clancey & Grindley, Edmonton; Northern Hardware Company, Edmonton; Mueller Manufacturing Company; McAvity & Sons; Canada Brass Goods Company. Galvanized Pipe — Jas. Robertson Company, Winnipeg, $806.96;* Ross Bros., Edmonton; Northern Hardware Company, Edmonton; Standard Plumbing & Heating Company, Edmonton; Gorman, Clancey & Grindley, Edmonton. Lead Pipe Northern Hardware Company, Edmonton, $7,426.48;* Gorman, Clancey & Grindley, Edmonton; Ross Bros., Edmonton; Standard Plumbing & Heating Company, Edmonton. Galvanized Fittings — Standard Plumbing & Heating Company, Edmonton.*
* denotes successful tenderer.

Toronto, Ont.
The Board of Control awarded to the Stanley Coal & Iron Company, Limited, the contract for cast iron pipe and specials for the main drainage works at $17,642.

Vancouver, B.C.
The following were the successful tenderers for galvanized pipe; A. J. Forsyth & Company, $2,622.50 (45,000 feet one-half inch at $3.45 per 100 feet, 10,000 feet of three-quarter inch, $4.55 per 100 feet, and 10,000 feet one-inch $6.15 per 100 feet). Successful tenderer for brass goods: Crane & Company, $3,356.50.

The following is a list of tenders received for wood block paving: Westminster avenue, Ninth to Sixteenth — Ironsides, Rannie & Campbell, $56,833; Palmer Bros. & Henning, $42,900; M. P. Cotton, $46,282; T. R. Nickson & Company, $47,832. Harris street — Carl W. Campbell; Ironsides, Rannie & Campbell, 28,851; Palmer Bros. & Henning, $22,900; M. P. Cotton, $25,076; T. R. Nickson & Company, $26,013. Seymour street, Georgia to Robson—Ironsides, Rannie & Campbell, $8,709; Palmer Bros. & Henning, $8,000; M. P. Cotton, $8,158; T. R. Nickson & Company, 8,291. Howe [illegible] nie & Campbell, $6,001; Palmer Bros. & Henning, $5,625; M. P. Cotton, $5,992; T. [illegible] rie & Campbell, $4,279; Palmer Bros. & Henning, $4,000; M. P. Cotton, $3,940; T. R. Nickson & Company, $3,777. The award [illegible] which means that T. R. Nickson & Com[illegible]

Railroads, Bridges and Wharves

Chatham, Ont.
The call for tenders for the railway deep-water extension has been cancelled.

Bobcaygeon, Ont.
The county councils of Peterborough and Victoria have decided to replace Little Bob bridge by a new concrete bridge 16 feet in width.

Collingwood, Ont.
Council is considering a $10,000 bridge bylaw.

Edmotnon, Alta.
The guarantee of $20,000 per mile of the bonds of the Alberta & Great Waterways Railway, for the purpose of securing the construction of a line from Edmonton to the Athabasca, has been finally approped, and the province stands committed to the enterprise.

Fredericton, N.B.
Tenders are being called by the Department of Public Works until March 4th for rebuilding Lester bridge, Malone bridge, and also for building Clifton high and low water wharf, King's County. Plans, etc., at office of above and at office of Geo. B. Jones, Apohaqui, King's County. John Morrissy, Chief Commissioner.

Fort William, Ont.
Work on the construction of the C.P.R. Bridge is to start as soon as the necessary order is secured from the Dominion Railway Board.

Lindsay, Ont.
The following tenders were received for the construction of an overhead bridge at 20th street: Algoma Steel Bridge Company, $14,500; A. J. Randall, $14,750; Jas. Priel $15,000. Contract not awarded.

Ottawa, Ont.
The Railway Committee of the House of Commons has finally reported the bill to incorporate the Nelson River Railway Company. A clause giving the company powers to construct tramways was struck out. Bills incorporating the Saskatchewan Central Railway and extending the time for the construction of the Prince Albert and Hudson Railway Company were also reported.

Reeve McNaught, of North Vancouver, will interview his financial agents relative to the bonds of the Burrard Inlet Tunnel [illegible] Second Narrows bridge. Tenders will be called for in the near future and construction will be begun early this summer and hastened to completion.

Tenders for the cribbing of the B. C. [illegible] submitted to the Bridge Committee, from [illegible] ten, and Palmer Bros. & Henning, all of [illegible] Mr. Cotton's bid totalled $3,365.96 and Mr. Palmer's, $3,860.25.

Prince Rupert, B.C.

A local paper is responsible for the statement that the G. T. P. has asked the Dominion government for authority to erect wireless stations across the mountains so as to connect Edmonton with Prince Rupert.

Revelstoke, B.C.

The C. P. R.'s surveying party, in charge of Mr. W. I. Bassett, has completed the location survey over the Hope mountain. At Hope the Fraser river will be bridged, and the line connected up with the main line of the company into Vancouver. Two years from now, it is said, will see the completion of the line.

Sault Ste. Marie, Ont.

Tenders are being called until March 17 by the Department of Railways and Canals for supply of timber, etc. See advertisement in this issue.

Winnipeg, Man.

The Canadian Northern will do a large amount of work next season in the filling up of their roadbed between here and Port Arthur. Orders are now out for the filling of all the bridges. There will also be a number of new bridges erected along the line.

Tenders have been called for the construction of a bridge across Long Lake by the Department of Public Works, Winnipeg. Plans, etc., at office of Maj. J. Proctor, clerk, Woodlands P. O.

Tenders are being called until March 14 for the construction of extension to planing mill at C. P. R. shops. Plans, etc., at office of Frank Lee, Division Engineer, this city.

P. E. Ryan, secretary, the Commissioners of the Transcontinental Railway, Ottawa, Ont., is calling for tenders until March 15 for the construction and erection of pump house (to be completed before July 1st) and of reservoir (to be completed before August 1st) for the locomotive shops of the Commissioners east of Winnipeg. Plans, etc., at offices of the Chief Engineer of the Commissioners, at Ottawa, and of the District Engineer, St. Boniface, Man. Tender for pumping plant will be received at the same time, etc., for the pumping plant necessary to equip the said pump house (installation on or before August 1st).

AWARDED.

St. Thomas, Ont.

The Yarmouth council awarded the contract for the construction of Dodd's bridge on the L. & P. S. gravel road to G. A. Ponsford at $2,336, the lowest. Other tenders were as follows: Jos. Vincent, $3,475; C. C. Stafford, $4,391; Spoyne & Ramey, $2,525; Williams & Walker, 2,975. The structure will be 50 feet and of reinforced concrete.

Saskatoon, Sask.

The contract for all structural steel required for new bridge over railway tracks has been awarded to Manitoba Bridge & Iron Works, Limited, Winnipeg, Man. General contractors, Algoma Bridge Company.

Shellmouth, Man.

The Manitoba Bridge & Iron Works, Limited, Winnipeg, Man., have been awarded the contract for all iron and steel for four combination spans here and at Russell.

Winnipeg, Man.

M. Peterson, secretary, Board of Control, writes that the contract for the new superstructure for Louise bridge has been awarded to the Algoma Steel Bridge Company, Winnipeg, at $134,450.00; also the contract for erection of pile bridge over Omand's creek has been awarded to the engineer of construction at $3,205.72.

Public Buildings, Churches, Schools, etc.

Buckingham, Que.

It is stated that Mr. Croisitiere has bought a site on Main street, on which he will erect a theatorium.

Berlin, Ont.

Ratepayers will vote on a $5,000 hospital bylaw.

Brandon, Man.

It is announced that the Methodists of the east end have purchased a site for a new church near Rideau Park, and every effort will be made to have the church completed this year. The congregation of St. Matthews hope to make a beginning on the new church on Thirteenth street

Brantford, Ont.

At a meeting of citizens a resolution was passed urging the City Council to pass a by-law for the issue of $100,000 debentures for the Market Square for market purposes entirely. It is planned to erect a new city hall and post office combined on another street.

Canmore, Alta.

At Canmore the C. P. R. will build a $26,000 Y. M. C. A. building.

Centreton, Ont.

Tenders will be received until March 24th for the erection of a school house on S. S. No. 11 and 12, Township of Haldimand. Plans, etc., at County Clerk's office. W. Stewart, secretary-treasurer.

Cranbrook, B.C.

The C. P. R. expect to erect this year in this place a railway Y. M. C. A. at a cost of $26,000. C. R. Sayer, Y. M. C. A., secretary of committee in charge.

A bylaw is being framed for the sale of the city's interest in the joint municipal government building, the proceeds therefrom to be devoted to the purchase of a site for the erection of a municipal building.

Edmonton, Alta.

Edmonton carried the bylaw to donate $70,000 towards the exhibition park, and defeated the $33,000 bylaw for library. The present market square can be used for a future city hall, according to the plebiscite.

Estevan, Sask.

The Lundquiest Bros. will erect a two-storey opera house opposite the Empire hotel. Dimensions, 27 x 120 feet. Contract for excavation has been let to Wm. Culvert. A firm of Minneapolis contractors will prepare plans. When these are completed tenders will be called for.

Tenders addressed to B. Glover, secretary, Public School Board, will be received until March 15th for the erection of public school. Plans, etc., at Builders' Exchange, Winnipeg, Man., and at offices of the architect, Wm. Zimmerman, at Moose Jaw, and this place.

Fonthill, Ont.

Tenders are being called for the erection of a school building here. See advertisement in this issue.

Hamilton, Ont.

Property east of the Caroline street school has been decided upon as a site for a new collegiate institute.

Tenders will be received until March 18th for the various trades required in the erection of a school at Jerseyville, Ont.

Ingersoll, Ont.

Tenders will be received until March 15th for the erection of a public hall at Dickson's Corners. Plans, etc., at residence of Wm. Hutchison, Dickson's Corners. Robt. Kerr, chairman of committee.

Kentville, N.S.

The Provincial Government has purchased the sharp farm here, as the site for a Dominion fruit experimental station.

Kildonan, Man.

At a meeting of the ratepayers it was decided to secure a site south of the brick yard for a new one-room school and also for a larger school in the centre district.

London, Ont.

The Masons have bought as a site for their new Masonic Temple, the Denton property on Queen's avenue, near Dr. John D. Wilson's residence. Work will be commenced early in May. All the money required has been subscribed. Noted in issue of January 12th.

Lethbridge, Alta.

A campaign will be started about March 14th to raise $45,000 for a new Y. M. C. A. building here. C. R. Sayer, Y. M. C. A. secretary, in charge.

Moose Jaw, Sask.

The Collegiate Board ask for plans to be submitted for the collegiate grounds. Twenty-five dollars will be paid for the plan adopted. For further information apply to J. W. Sifton, superintendent of schools.

Milton, Ont.

The public school buildings will be enlarged and remodelled. Noted in issue of February 2nd.

Montreal, Que.

Tremblay & Francoeur have been awarded the contract for the installation of plumbing and heating in the new Montreal Technical School.

Messrs. Brown & Vallance, architects, Canada Life Building, are preparing plans and specifications for an additional wing to be added to the Medical Building of McGill University. These plans will be ready in the course of two weeks.

Mr. A. F. Dunlop, architect, Lindsay Building, has completed plans for the Earl Grey School Building and will receive tenders for the construction of same until March 10th.

Tenders for the construction of the new Rosemount School will be received until Thursday, March 10th at the office of Mr. A. F. Dunlop, architect, Lindsay Building.

Longueuil, opposite Montreal, is to be the site of the military depot. Land to the extent of 180 acres has been purchased, which will provide for the necessary buildings and parade grounds.

The Nationaloscope Theatre, corner of St. Catherine and St. Andre streets, was badly damaged by fire on the 5th inst. Total estimated loss, $20,000.

The annual report of Notre Dame hospital shows a surplus of $7,377.81, which may be appropriated towards the continuation of the building now in progress..

The Board of Control will take up the question of building a city hall annex.

Mr. Alphonse Content, 17 Place D'Armes Hill, is preparing plans for an extensive presbytery to be erected at Coteau Station, Saint Medard, Que. Tenders will be received for the construction of same during the last week of March.

North Vancouver, B.C.

A new Anglican church to be known as the Church of St. Agnes, is to be erected. Rev. H. H. Gillies is in charge.

Peterborough, Ont.

At a meeting of the Property Committee, held last week, Ald. Duncan, chairman, was authorized to secure plans for an isolation hospital to cost not more than $12,000. Former plans prepared called for an expenditure of about $8,000.

Tenders addressed to E. M. Elliott, County Clerk, will be received until April 8th for the installation of a steam heating system in the Court House. See advertisement in this issue.

Revelstoke, B.C.

$30,000 towards a new school buiding, having been granted by the government, the city council and school trustees are arranging to submit a bylaw to the people for the amount that has to be raised locally.

Regina, Sask.

A by-law to provide for a $16,000 market building will be submitted to the ratepayers on the 24th of March.

The establishment of a new Methodist College here for the province has been authorized by the special committee of the Conference, of which Dr. Carman, 33 Richmond street, Toronto, Ont., is president. Rev. J. H. Oliver, and M.r G. W. Brown, Regina, are interested. Estimate of first building, $250,000. Plans have not been prepared yet.

Saskatoon, Sask.

The ratepayers will vote on the 9th inst. on the following bylaws: $100,000 Hospital; $9,000 collegiate institute; $21,000 for completing civic hospital and buildings for fair purposes.

Sinclair, Man.

Tenders will bereceived until March 16th by Geo. Watson Milliken, secretary-treasurer, for the erection and completion of a two-room brick veneer building. Plans at office of W. A. Elliott, architect, Brandon, and at office of the above mentioned.

Strathcona, Alta.

The Board of Trade has been advised by the Hon. Wm. Pugsley that a new armory and post office, to cost $200,000, will be erected this year.

St. John, N.B.

The Exhibition Association is calling for tenders until March 12th for the erection of a new building for the Dominion Fair. Plans at exhibition office, Prince William street.

Stratford, Ont.

Plans for the new registry office for North Perth are at the court house.

Sperling, Man.

Tenders addressed to Frank R. Evans, 506 Somerset Building, will be received until March 12th for all trades required in the erection and completion of a 4-room brick veneer school building here. Plans, etc., obtained from the secretary-treasurer.

Toronto, Ont.

A building permit was granted to the new Bonar Presbyterian Church on the west side of St. Clarens avenue, north of College street, cost $38,000.

Tenders are being called by the Board of Education for the several trades required for the enlargement of Kimberley Avenue School. See advertisement in this issue.

Victoria, B.C.

There is a possibility that the ratepayers may be called upon to consider the question of a new city hall. Mayor Mr. Morley.

The board is looking for a site for the new high school, for which funds were provided by the bylaw.

Winnipeg, Man.

The city is making an application to legislature for an amendment to the charter so that $500,000 may be raised for hospital and morgue purposes.

An athletic association is being formed and appplication for charter will be made. The intention of the club is to provide a club house after the style of the Montreal A. A. A.

AWARDED.

Montreal, Que.

Mr. Jos. Venne, architect, 5 Beaver Hall Hill, has awarded contracts as follows in connection with the alterations to the Church of St. Enfant-Jesus at Mile End: General contract, Martineau & Prenouveau; decorations, Art & Industrial Company, of Montreal; installation of chimes, J. Vennat. Estimated cost, $20,000.

Regina, Sask.

Wilson & Wilson, of Regina, were awarded the contract for the new public school at $68,750. The tenders were :Smith Bros., & Construction Company, $76,549; S. Brown, Winnipeg, $78,000; McKay Construction Company, $79,270.

St. Boniface, Man.

The contract for fire escapes on the Convent Building has been awarded to the Manitoba Bridge & Iron Works, Limited.

Stratford, Ont.

Wilson & Wilson have been awarded the contract for the new school at $68,750. Four other tenders were received, including one from S. Brown, Winnipeg, $78,000.

Toronto, Ont.

The contract for constructing the new Logan Avenue School has been given to Lucas Bros. for $25,837, while Hanna & Nelson received the plastering tender for $3,815.

Winnipeg, Man.

The Manitoba Bridge & Iron Works, Limited, have been awarded the contract for the structural steel and iron for addition to old post office building, Main street, also for the same in the veterinary hospital.

Residences

Belleville, Ont.

Mr. A. E. Bailey has purchased the old separate school, which he purposes changing into a semi-detached dwelling.

Fort William, Ont.

Foundation stone is being piled on the site of the five storey apartment building which John King has announced will be constructed at a cost of $100,000 on his George street property. Final arrangements await the decision about the gas.

Hull, Que.

It is stated that Mr. S. J. Willoughby and Dr. J. E. Taggart, 61 Sparks street, [illegible] will be sold as building lots.

Montreal, Que.

Plans, etc., are being prepared for three pairs of semi-detached villas to be erected in Outremont, Que., Further information will be furnished later. Mr. Jas. E. Adamson, architect.

James E. Adamson, architect, Coristine Building, is preparing plans for a first-class residence to be erected in Westmount for Mr. J. H. Charlton. Further information will be given later.

Messrs. Ogilvie & Mitchell, architects, Molson Bank Building, St. Catherine street west, have prepared plans for the erection of semi-detached residence on Roslyn avenue, Westmount, for Mr. A. H. Chave. Tenders are now being received.

Messrs. MacVicar & Heriot, 104 Union avenue, have prepared plans and will receive tenders until March 14th for the erection of a residence for Mr. C. J. McCuaig.

Mr. Robt. Findlay, architect, 10 Phillips Place, has prepared plans for a residence for J. E. C. Meagher, to be erected on Pine avenue. Tenders will be received until March 12th.

J. Montgomery Rodden, architect, 8 Beaver Hall Square, has received tenders and will shortly award the contract for the erection of a residence on Columbia avenue for Mrs. Pope.

Rothsay, Ont.

The Presbyterians purpose building a new manse this summer.

St. Helens, Ont.

Tenders will be received until March 15 for the erection of a manse. Plans at office of W. L. Miller, secretary of building committee.

Sintaluta, Sask.

Premises occupied by John Dickey, John Wilson and others were destroyed by fire recently. Estimated loss, $4,000.

Winnipeg, Man.

Excavation has been started on the 3-storey apartment block, corner of River avenue and Lewis street. Dimension 100 by 120 feet; materials, red brick with white stone facings. J. Moxam, builder; Herbert Matthews, architect.

Worswick Bros., contractors and builders, of Elmwood, have purchasel a piece of property on Johnson avenue, close to the Bird's Hill road, on which they intend to build several fine residences at once.

AWARDED.

Montreal, Que.

Geo. W. T. Nicholson, Eastern Townships Bank Building, has been awarded the contract for the erection of seven houses on the Durnford Estate, corner Atwater and Tupper streets. MacVicar & Heriot, 104 Union avenue, architects.

Marchand & Haskell, architects, 164 St. James street, have awarded the general contract for the erection of a house for Mr. Urban, on St. Catherine road and Wiseman avenue, Outremont, to N. Deslauriers, contractor, Westmount.

Robert. Findlay, architect, 10 Phillips Place, awarded contracts for the erection of a residence for Mr. G. H. Bishop, as follows: Masonry and brickwork, C. E. Deakin; carpentry, D. M. Long.

Messrs. Hutchison, Wood & Miller, architects, Royal Insurance Building, have awarded the contract for the erection of a residence at Hudson Heights, Que., for Mr. J. W. Pyke, to Mr. D. M. Long.

Business Buildings and Industrial Plants

Brandon, Man.

[illegible] Canadian Northern Railway which on its [illegible]

Comber, Ont.

The Forbes hotel, and business block occupied by Jas. Jenkins, were destroyed by fire on the 4th inst. Estimated loss, $8,000.

Calgary, Alta.

The G. F. & J. Galt Company will erect a 3-storey warehouse on Tenth avenue and Seventh street west to cost $15,000.

Bert. Stringer will erect on Ninth avenue and Second street west, a warehouse to cost $15,000.

Fort William, Ont.

It is rumored that plans are being prepared for a new C. P. R. hotel to be erected near the site of the new station.

Gananoque, Ont.

F. W. Jackson will replace the old cheese factory here by a new building.

Moncton, N.B.

The American House was badly damaged on the 26th ulto. Estimated total loss, $20,000.

Macleod, Alta.

The Grier block was badly damaged on the 26 ulto. Estimated total damage, $25,000.

Midland, Ont.

The Georgian Bay shook mills are considering the erection of an additional dry kiln for the treatment of their lumber and finished products.

Montreal, Que.

Marchand & Haskell, architects, 164 St. James street, are busy preparing the initial plans and specifications for the proposed extensive workshops which the Montreal Street Railway Company contemplate erecting in the north end of the city.

C. Duford, architect, La Patrie Building, has prepared plans and specifications and is inviting tenders for the erection of four stores and four dwellings on Craig street for Messrs. Bloomfield Bros.

Tenders closed March 7th at the office of J. Montgomery Rodden, architect, 8 Beaver Hall Square, for the construction of a steel fireproofed building and stables for the Mount Royal Riding Academy.

Mr. C. A. Reeves, architect, 58 St. James street, is preparing plans for new factory and warehouse buildings, to be erected in Maisonneuve for the Tetreault Shoe Manufacturing Company. The factory building will be 500 by 50 feet and the warehouse 212 by 90 feet, both five storeys in height. The slow burning mill construction will be specified, for the construction of these buildings, and it is the intention of the company to install an up-to-date sprinkler system. The architect expects to call for tenders early in April.

T. Pringle & Sons, architects, Coristine Building, have prepared plans for the erection of a new factory building for the Holland Varnish Company.

The Montreal Steel Works, Limited, Etienne street, is preparing to erect an extensive foundry building. T. Pringle & Sons, architects, Coristine Building, are preparing plans for this new structure.

The plans for the building to be erected for the Blumenthal estate on Balmoral street, will be enlarged by the associated architects, Ogilvie & Mitchell, to include the erection of a building on an additional property which has just been purchased. Tenders recently called for the construction of this building will therefore be delayed until the completion of the new plans.

North Vancouver, B.C.

It is reported that a company of western capitalists are considering locating a plant here for the manufacture of Pullman cars. C. Wilson, of Seattle, is interested. Capital to be invested, said to be, $1,000,000.

Parry Sound, Ont.

A site has been secured by the Union Iron Works Company, Limited, for the erection of machine shops, foundry, docks, etc. The buildings will cover 25,000 square feet, and be built of concrete. Plans are now being prepared by H. Bryan Gilbert, architect, 47 Wellington street east, Toronto, who will call for tenders in the near future.

Quebec, Que.

We are informed that the Quebec Railway, Light, Heat & Power Company, Limited, have purchased the Jacques Cartier market site containing 10,605 square feet, corner of Crown and St. Joseph streets, and as soon as plans are prepared, a six or eight-storey office building will be erected. Annual meeting on the 12th inst. at the office of Greenshields & Greenshields, Montreal, when details will be more definitely arranged.

Red Deer, Alta.

The C. P. R. will erect a new station here to cost $20,000.

Revelstoke, B.C.

The Imperial Bank of Canada has decided to proceed at once with the erection of the new branch here.

St. Johns, Que.

John Donaghy's building at the southern end of Richilieu street, was badly damaged by fire on the 27th ulto. Estimated loss, $3,500.

Shoal Lake, Man.

The implement warehouse of J. D. McLachlan was destroyed by fire. Loss, $4,000.

Saskatoon, Sask.

The Bank of British North America has purchased a building site, where a large building will be erected in the spring as a branch.

Three Rivers, Que.

Several new buildings will shortly be started in the business section. Among others will be the Quebec Bank at the corner of Des Forges and Bordeau streets.

Thornbury, Ont.

Hugh Baird & Sons, formerly of Markdale, Ont., now of this town, are asking for a free site and exemption from taxation for which they propose to erect a saw mill.

Toronto, Ont.

A building permit has been granted to the Toronto Showcase Company's new two-storey factory on the east side of Carlaw avenue, near Queen street, to cost $32,000.

Lever Bros. have obtained a building permit for a brick addition to factory on Eastern avenue and Don, $17,000.

No. 2 machine shop of the Schofield-Holden Machine Company, Carlaw avenue, was damaged to the extent of about $7,000 on the 7th inst.

The International Motor Car Company, 60 Jarvis street, are calling for tenders for concrete floors. See advertisement in this issue.

The Dodge Manufacturing Company, West Toronto, are considering the erection of a new warehouse for the storage of their finished products. Plans are now being drawn for the building.

The Janes Building, northeast corner of King and Yonge streets, has been purchased by Henry Osler, K.C., for clients, whose names are withheld. The tenants are entitled to a six months' notice, and surveyors have been looking over the building but no definite plans for the 16-storey structure have been made.

Wauchope, Sask.

The C. P. R. will build a new station here this spring.

Watrous, Sask.

A syndicate was formed in this town recently to build a 75-roomed hotel at Lake Manitou. The syndicate has purchased the quarter section owned by Geo. Saunders for $20,000.

Winnipeg, Man.

A firm of British capitalists are looking for a business site here. William Bruce, of this city, is acting for them. E. E. Wire, also of Winnipeg, is now in London, Eng., making arrangements for transfer of capital.

The Manitoba Gazette announces the incorporation of the Selkirk Hotel Company, capital $1,250,000, the objects of which are to build hotels. The directors named for the new concern are, J. W. de C. O'Grady, J. A. Anderson, financial agents; John Geddes, commission merchant, and George Summer, accountant. The charter also gives the company the power to erect a theatre.

AWARDED.

Fernie, B.C.

The Manitoba Bridge & Iron Works, Limited, Winnipeg, have been awarded the contract for the placing of fire escapes and iron stairways in the Royal hotel.

Fort William, Ont.

The contract for the structural steel and iron and ornamental iron in the new Union Station has been awarded to the Manitoba Bridge & Iron Works, Limited, Winnipeg, Man.

Messrs. Mason & McNeil, structural iron workers, have been awarded the contract for the building of the big smoke stack on the Kakabeka Falls Brewing Company's works.

Morrisburg, Ont.

John J. Helmer, Newington, and Harry Winstanley, this place, have been awarded the contract for the erection of the tack factory.

Montreal, Que.

Contracts have been awarded as follows in connection with the seven storey factory, which the St. Lawrence Sugar Refining Company, Limited, is erecting in Maisonneuve: Stone and brick work, E. G. M. Cape; fireproofing, Messrs. Church & Ross.

Port Colborne, Ont.

The Tromanhauser Construction Company, Temple Building, Toronto, have been awarded the contract for construction of the Hedley-Shaw mill here. Contract for excavation has been given to J. L. Weller, of St. Catharines.

Regina, Sask.

The contract for steel framing for R. H. Williams' five-storey departmental store has been awarded to the Manitoba Bridge & Iron Works, Limited, Winnipeg, Man.

Toronto, Ont.

The Sanitary Floor Company, of Toronto, have been awarded the contract for furnishing and laying "Sanorto" floors in the four-storey apartment house on Yorkville avenue, at $5,450.14. Messrs. Crossley & Sons, owners; Leonard Foulds, architect.

Winnipeg, Man.

The Manitoba Bridge & Iron Works, Limited, Winnipeg, have been awarded the contract for the structural steel in connection with the new Bank of Montreal. Erroneously reported in issue of February 23 as having been given to Dominion Bridge Company, of Montreal, Que.

The Manitoba Bridge & Iron Works, Limited, this city, have been awarded the contract for complete sets of grain elevator transmission equipment for 24 elevators for the Maple Leaf Flour Mills Company.

Power Plants, Electricity and Telephones

Brandon, Man.

The Municipal Light, Heat & Power Company, head office, Hamiota, will establish warehouse and plant here in addition to those in operation in Carnduff, Sask. G. Edgar Knetchell, manager.

Bracebridge, Ont.

Alex. C. Salmon, town clerk, writes that the council did not accept any tenders for the erection of Wilson's Falls power house, but will undertake the work by day labor.

Hull, Que.

The following tenders were received for the construction of an addition to the corporation power house: Noel & Ouellette, $19,981; E. Bisson, $23,511.85. These tenders were found too high, and new tenders have been called on a modified form. J. F. Boult, city clerk.

Montreal, Que.

The Bergmann Electrical Works, of Berlin, Germany, manufacturers of tungsten lamps, are considering the location of a branch industry here. For further information apply to Dr. C. Rossner, 341 Dorchester street west.

The Montreal Street Railway Company have made application to the Council for the permission to increase its trackage in this city by thirteen miles.

Nelson, B.C.

The council have decided that they will have to meter the electric light service or purchase new transformers.

Owen Sound, Ont.

The Bell Telephone Company will install a "central agency" system in the local exchange within the next year. H. R. Polson, local manager.

Prince Albert, Sask.

C. H. Mitchell, of Mitchell & Mitchell, consulting engineers, Traders' Bank Building, Toronto, Ont., has reported favorably on La Colle Falls as a site for power development. The proposed plans call for a canal a mile long and a dam across the river 750 feet in length.

Sherbrooke, Que.

The ratepayers will vote on March [illegible] on a bylaw regarding street railway extensions. A new company, to be known probably as the Sherbrooke Electric Railway & Power Company, Montreal, Que., have asked the right to sell power and have practically agreed to expend [illegible] on installation of a plant.

St. Thomas, Ont.

The following were the tenders received for the full equipment for the installation of Niagara power: Canadian General Electric Company, [illegible]; Lancashire Dynamo & Motor Company, $18,447, and the Canadian Westinghouse Company, $18,170. Noted in last issue.

Toronto, Ont.

Included in the supplementary estimates of the Provincial Treasurer are the following items: Electric plant, Hamilton Asylum, $12,000; electric plant, London Asylum, $25,000; electric plant, Ontario Agricultural College, Guelph, $15,000.

Justice Britton has quashed the bylaw authorizing Blanchard township to raise $20,000 for the purpose of taking over debentures of the St. Marys & Western Railway.

Victoria, B.C.

Tenders have been called for the following: Copper coated carbons; high grade carbons for enclosed lamps; the installation of arc lighting system for James Bay causeway and Belleville street. Wm. W. Northcott, purchasing agent.

Welland, Ont.

George H. Pettit is solicitor for a company organized to build an electric railway from Queenston to Niagara. The length of the railway will be seven miles and will cost about $50,000.

Weymouth Bridge, N.S.

The Campbell Lumber Company are contemplating the installation of an electric plant at the Upper Site, known as Sissiboo Falls, to generate electricity for their lower pulp mill, as well as lighting the neighboring towns. G. D. Campbell, president.

Winnipeg, Man.

The following tenders for power and testing transformers were received by the Board of Control: Canadian General Electrical Company, Canada, $138,250; Canadian Westinghouse Company, Canada, $116,500; Siemen Bros., England, $111,725; Ferranti, Limited, England, $89,850; Kolben & Company, Austria, $72,100; Brown-Boveri, Switzerland, 39,700. That of the Westinghouse Company, Canada, was recommended as having the advantage of being a similar equipment to that ordered for the generating station, which will lessen cost of inspection. Only one tender was received for the supply and erection of the oil and water system for the terminal station, that of Canadian Fairbanks Company, for $6,482, which was recommended. In regard to the tenders for the supply and erection of light, heat and power systems for the terminal station, the engineers recommended that of Chapman & Walker, Toronto, at $8,225. There were three Winnipeg tenders as follows: Canadian General Electric Company, $11,200; Shipman Electric Company, $11,715; and Reese Engineering Company, $15,064.

M. Peterson, secretary, Board of Control, writes that the tenders for supply and installation of cooling tower, etc., have not been awarded yet.

AWARDED.

Exshaw, Alta.

The contracts for reinforcing steel and iron stairways, etc., for transformer station for Calgary Power & Transmission Company, have been awarded to the Manitoba Bridge & Iron Works, Limited, Winnipeg, Man.

London, Ont.

The contracts for supplies for the new power station for [illegible] have been awarded as follows: Ten oil insulated wat[illegible] [illegible] Limited [illegible] voltage regulators [illegible] Company [illegible] Canadian General Electric Company [illegible] nections between all apparatus, Canadian General Electric Company, $10,100; complete set portable instruments as specified, Ferranti, Liimted, $1,375; constant direct current arc light transformer and rectifier, and sixty arc lamps with absolute cut-out, Canadian General Electric Company, $4,300; eight constant current transformers, for street series, incandescent lighting, Ferranti, Limited, $2,425; 1,550 street fixtures, as specified, Wheeler Reflector Company, $6,286; 2,000 series 6.6 ampere 75 or 80 watt lamps, Sunbeam Incandescent Lamp Company, $2,500. Total, $47,636.

Niagara Falls, Ont.

Toronto Power Company has awarded the contract for three complete sets of generating apparatus of approximately 10,500 k.w. each capacity. The elecrtical equipment goes to the Canadian General Electric Company, and the turbines to the I. P. Morris Company, Philadelphia, U. S.

Toronto, Ont.

The following contracts for transformers were awarded by the council: Canadian General Electric Company, $8,800; Canadian Westinghouse Company, $5,430; Allis-Chalmers-Bullock, Limited, $12,670.

Winnipeg, Man.

The tender of the Jens Orten-Boving Company, of London, Eng., for the supply of seven turbine governors for the power plant was accepted at $23,000. Two other tenders were received, as follows: Ludlow Valve Manufacturing Company, Troy, N. Y., $12,200; Lombard Governor Company, Ashland, Mass., $18,000. The tender of Glenfield & Kennedy, Kilmarnock, Scotland, for the supply of five foot valves for the power plant was accepted at $2,852.

Miscellaneous

Brampton, Ont.

The County of Peel have passed a bylaw to spend $100,000 on road construction.

Dauphin, Man.

Tenders addressed to J. W. Johnston, town clerk, will be received until March 15 for the purchase of $14,000 20-year local improve debentures, 5 per cent.

London, Ont.

Recent building permits include: Priddi Bros., improvements to store, $3,700; W. Wakeling, double house on Campbell street $2,200; Geo. Bawden, two storey and attic on Wellington street, $2,700; John Richards, two houses, Adelaide, $2,400 each; R. Dickinson, dwelling, Belleview avenue $2,000; Huron College, repairs, $2,000.

Tenders will be called for immediately for 2,000 feet of hose to augment the amount at present used by the fire department.

The following is a list of estimates presented by the Board of Works for 1910:— Storm sewer, $8,000; asphalt repairs, $3,000; bridges, $3,000 City Hall expenses, $1,800; city parks, $4,000; city greenhouse, Victoria Park, $5,000 dredging river, $1,000 exhibition buildings, $900; exhibition buildings [illegible] West London breakwater, $1,300; militia camp, [illegible] and culverts, $4,500; streets an dgeneral [illegible] ment Talbot street, $2,500; lowering grad[illegible]

(Continued on page 27)

Tenders and For Sale Department

Tenders for Concrete Floor

WANTED—Tenders for concrete floor, about [illegible] THE INTERNATIONAL MOTOR CAR CO. LIMITED, 60 Jarvis street, Toronto. 10

To Heating Contractors

Sealed tenders addressed to the undersigned will be received until noon on FRIDAY, THE 8TH OF APRIL, 1910, for the installation of a Steam Heating System to heat the Court House and County Buildings in Peterborough.

Particulars for guidance of parties tendering can be had on application to the undersigned.

ED. M. ELLIOTT,
County Clerk.

Peterborough, March 5th, 1910. 12

Tenders for
Building Brick School

Tenders will be received by the undersigned until twelve o'clock noon on MONDAY, MARCH 14TH, 1910, for the erection and completion of of a four-roomed brick school building to be situated in the Village of Fonthill, County of Welland, Ontario.

The lowest or any tender not necessarily accepted.

GEO. A. HOWELL,
Sec'y-Treasurer,
Fonthill, Ont.

A. E. NICHOLSON,
Architect,
St. Catharines, Ont.
10

Tenders For
Gas Franchise

Bids, sealed and endorsed "Gas Franchise," will be received by the City Clerk of the Corporation of the City of Fort William, up to APRIL 1ST, 1910, for the letting of a Gas Franchise, including construction of Plant, Mains, etc., and operation.

Conditions, specifications and form of tender, on which bids must be submitted, can be obtained from the undersigned.

Lowest or any tender not necessarily accepted.

JOHN WILSON,
Assistant City Engineer,
Fort Wililam, Ont.
12

CITY OF BRANTFORD

Tenders for
Cement and Sewer Pipe

Sealed Tenders addressed to Ald. Joseph Minshall, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock noon on THURSDAY, MARCH 17TH, 1910, for supplies of the above material required by the City of Brantford during 1910. Specifications may be seen and instructions to bidders and forms of tender obtained on application to the City Engineer.

Each tender must be accompanied by a marked cheque, payable to the order of the City Treasurer, for the amount called for in the form of tender.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer,

City Hall, Brantford, March 4th, 1910. 10

City of Brantford

Sewer Construction

Sealed tenders addressed to Ald. Joseph Minshall, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock noon on THURSDAY, MARCH 31st, 1910, for the furnishing and laying of about 2,180 feet of 12-inch extra strength Sewer Pipe, and 705 feet of 12-inch Cast Iron Pipe, together with 12 manholes; greatest cut 31 feet; average cut, 16½ feet.

Plans and specifications may be seen and instructions to bidders, and forms of tender obtained at the City Engineer's Office.

Each tender must be accompanied by a marked cheque for 5 per cent. of the amount of the tender.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.

City Hall, Brantford, March 4th, 1910. 12

Board of Education

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board, will be received until FRIDAY, 2 P.M., MARCH 11TH, 1910, for the several trades required for the ENLARGEMENT OF KIMBERLEY AVENUE SCHOOL. Plans and specifications may be seen and all information obtained at the office of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in the said specifications and forms of tender. The lowest or any tender will not necessarily be accepted.

W. H. SMITH,
Chairman of Committee.

W. C. WILKINSON,
Sec.-Treas.

Dated at Toronto, March 5, 1910, 10

Department of Railways and Canals

Sault Ste. Marie Canal

Tenders for Supplies
for the year 1910

SEALED TENDERS addressed to the undersigned and endorsed "Tender for Supplies," will be received at this office up to 16 o'clock or THURSDAY, THE 17TH MARCH, 1910, for the supply and delivery of Timber, Hardware, Electrical and various other supplies required for use on the Sault Ste. Marie Canal for the year 1910,

Specifications, forms of Tender and full information may be obtained at the office of the Superintending Engineer, Sault Ste. Marie, Ont., on and after Monday, the 28th February, 1910.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 28th February, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 11

Tenders For
Gaol Heating

Tenders will be received by the undersigned up to noon on SATURDAY, MARCH THE 19TH, 1910, for the heating of the County Jail at the Town of Barrie, according to plans and specifications which may be seen on application to H. W. Beardsley, County Clerk's Office, Court House, Barrie. All tenders to be sealed and marked "Tenders for Goal Heating" and addressed to

C. J, PICOTTE,
Chairman County Property Committee,
11 **Box 128 Penetanguishene, Ont.**

Tenders for Dredging

Sealed tenders addressed to Thomas Richardson, Clerk of the Township of March, South March, Ont., will be received up to 12 o'clock noon of the 15TH DAY OF MARCH, 1910, for Dredging Work on the Carp River within the Townships of March and Huntley, in the County of Carleton, to be done in accordance with the report, plans, profiles, specifications and estimates of J. H. Moore, C.E., filed with the Township of March, on the Carp River, Drainage Improvement Scheme. Tenders must be accompanied by a marked cheque for $1,000.00, payable to the Treasurer of the Township of March. The above plans, profiles, specifications, etc, may be inspected and full particulars and form of tender obtained from J. H. Moore, C.E., Smith's Falls, Ont., or from the Township Clerk, South March, or at the office of Messrs. Beaument & Armstrong, 25 Sparks Street, Ottawa.

The lowest or any tender received not necessarily accepted.

THOMAS RICHARDSON,
Clerk.
10 South March, Ont.

TENDERS

University of Saskatchewan

Sealed tenders, addressed to the undersigned, will be received not later than the 21ST DAY OF MARCH, 1910, for the different trades required in the erection of the College Building, Students' Residence, Power House, Live Stock Pavilion, Agricultural Engineering Building, on the University Grounds in Saskatoon.

The right to reject any or all tenders and to waive any defects or irregularities therein, is to be at the discretion of the Board of Governors.

Tenders are to be made on forms furnished by the architects.

Each tenderer is to enclose with his bid an accepted cheque for 10 per cent. of the amount of his tender, which deposit will be forfeited if the tenderer fails to execute the contract and bond when requested, and will be returned to the unsuccessful bidders when the contract is signed.

Plans and specifications may be seen at the office of the University, Saskatoon, Sask., or at the office of the Architects, David R. Brown and Hugh Vallance, Canada Life Building, Montreal, Que., and at the rooms of the Builders' Exchange, Winnipeg, Man,

WALTER C. MURRAY,
President.

Saskatoon, Sask., February 21st, 1910. 11

Plant for Sale

For Sale:—The following Second-Hand Plant, cated at Durham, Ont., or portion theerof. The hole lot at a reduced price,

25 No. 3 American, square pan, wooden hub, heel Scrapers.
28 No. 3 K. & J., round pan, iron hub, Wheel crapers.
6 No. 3 Western, square pan, with doors, heel Scrapers.
7 No. 2, K &J, round pan, iron hub improved, heel Scrapers.
55 Doors and Gates, for No. 3 Wheel Scrapers.
27 Slush Scrapers.
15 Light and Heavy Plows.
Located at Three Rivers, Que.
One Large Travelling Clam Shell Derrick.
One Steam Pile Hammer (Cram Patent), with team Hose.
One Thomas Automobile (Model 31), 60 h.p., horoughly overhauled and painted; location, oronto.

HE RANDOLPH MACDONALD CO., LIMITED,
4 Crown Life Building, Toronto, Ont.

Position Vacant

WANTED.—ARCHITECTURAL DRAFTSMAN, ne accustomed to general office work. State perience and salary expected. Box 940 Conct Record, Toronto.

WANTED.—MECHANICAL ENGINEER, to nanage Stone Crushing Business, liberal salary o a good man. Apply Box 935 Contract Record, oronto. 10

Miscellaneous

ALLAN W. HORWOOD, Registered Archiect, has opened an office in the Bank of Otawa Building, Bank street, Ottawa, Ont., and vill be glad to receive manufacturers' catagues. 10

AGENCIES WANTED.—Three young men going to Vancouver, B.C., to open a manufacturing agency office are open for some good ines in the Mechanical, Electrical and Contruction business. Address Box 937 Contract Record, Toronto. 10

Miscellaneous

(Continued from page 25.)

portion, $520; court house and jail, $1,000. Total estimates 1910, $99,530.

Montreal, Que.

At a general meeting of the Catholic architects of Montreal it was decided to collaborate in the preparation of plans for special decorations of Montreal streets in connection with the Eucharist Congress, to be held in this city about September 11th. The general scheme for this work will be prepared by Joseph Venne, architect, 5 Beaver Hall Hill, who will apportion the work amongst the different architects.

Recent building permits include: L. Fournier, 2155 St. Denis street, house containing three dwellings, $2,000; W. Maille, 2228 St. Hubert street, house containing four dwellings, $2,000; A. Leger, 198a Notre Dame street, house containing two dwellings, $2,000; N. Belanger, 1457 Hotel de Ville, house containing three dwelilngs, $2,500; Chas. Dagenais, 135 Dufferin street, house containing four dwellings, $3,500; H. Plante & Company, 2881 St. Hubert street, house containing three dwellings, $2,200; Mrs. G. Cote, 261 Amherst street, alterations to store and dwelling, $3,000; M. McAuley, 225 St. Patrick street, factory building, $2,000; E. Daoust, 1813 St. Denis street house containing two dwellings, $2,000; S. Anovitz, 1239 St. Hubert street, two houses containing six dwellings, $8,000; G. Poliquin, 1798 Park avenue, apartment house, $10,000; A. Mainville, 833 a Albert street, house containing three dwellings, $2,000; J. Borderie, 3331 St. Hubert street, house containing three dwellings, $2,000.

Victoria, B.C.

The estimates brought down foreshadow an expenditure of $7,738,257 for the coming year. Of these, $4,256,000 is for public works; $250,000 for the Second Narrows bridge, $200,000 for the new Vancouver court house, and $100,000 for the municipality of Paint Grey.

Permits issued recently include: Messrs. Taylor Mills Company, a dry kiln and boiler house, Government street, $3,500; J. Maynard, two dwellings, Heywood avenue, $2,500 each; H. Calwell, stable and dwelling, Cormorant street, $5,000; Mrs. McLellan, dwelling on Pandora avenue, $2,600.

Vancouver, B.C.

Tenders will be invited for two motor wagons for the scavenging department to cost approrimately $11,000. W. A. Clement, city engineer.

Vancouver, B.C.

Recent building permits include: W. W. Walsh, frame apartment house, Barclay street, between Bidwell and Cardero, $13,000; E. R. McConkey, 2042 Eighth avenue west, two houses, $4,000; Mr. Lewis, 475 Thirteenth avenue west, $3,000; Wicker & Ives, 1933 Fifth avenue west, $2,000; J. D. Murray, 1763 Fifth avenue west, $2,000; C Gray, 937 Woodland drive, $3,200; J. Turnbull, 36 Eleventh avenue west, $3,000; A. Lockheart, 1581 Tenth avenue east, $2,000.

Winnipeg Beach, Man.

Tenders addressed to N. Tessier, secretary, Department of Public Works, Ottawa. Ont., will be received until March 24th for the construction of a pile protection pier. Plans, etc., at Public Works Department and at office of A. R. Dufresne, District Engineer, Ashdown Block, Winnipeg, and on application to the local postmaster.

Winnipeg, Man.

Recent building permits include: M. Le Page, apartment block, Balmoral, between Ellice and Sargent, $18,000; Lutheran church building, northwest corner Manitoba avenue and Brown street, $2,400.

Ottawa, Ont.

Tenders addressed to W. W. Corry, Department of the Interior, will be received until March 15th for the supply of 150 cast iron monuments for use in marking the international boundary.

Picton, Ont.

The village of Bloomfield has carried a bylaw to raise $3,000 to further improve the streets and walks and purchase gravel pits and road machinery.

Regina, Sask.

On March 24th bylaws will be voted on here as follows: — Albert street subway, $41,000; sewerage and waterworks extensions, $10,000; exhibition buildings, $25,000; market house, $16,000.

The following is a list of debentures purchased [illegible] Village of Fairlight, $1,200, ten instalments, [illegible] 1-2 per cent.; town of Davidson, Sask., $17,000, twenty instalments, 5 1-2 per cent.; village of Semans, Sask., $2,000, fifteen instalments, 6 per cent.; Sinclair S. D., Man., $6,000, twenty instalments, 5 per cent.; Carmangay S. D., Alta., $15,000, twenty instalments, 6 per cent.; Magrath S. D., Alta., $4,000, thirty instalments, 5 1-4 per cent.; Monarch S. D., Alta., $6,000, twenty instalments, 5 1-2 per cent. Small school issues amounting to $15,000.

Toronto, Ont.

Included in the supplementary estimates of the provincial treasurer are the following: New wing at Osgoode Hall, $50,000; colonization roads, $464,000; other public works, $37,940.

Recent building permits include: Ada E. Miller, 1 pr. brick dwellings, on N.S. Lappin, $4,000; Dr. J. F. Gallanough, 7 att. 2 sty. brick stores & dwellings, cor. Brunswick & Bloor, $24,000; Robt. S. Unwin, alt. to dwelling, 378 Markham, $5,600; MacMillan Publishing Company, 1 sty. brick addn.. to warehouse on 70 Bond street, $5,000; R. Nancarrow, 2 1-2 sty. brick dwelling, on W. S. Medland, $3,000; B. Sinclair, alt. to stores & dwellings, 1477-1479 Yonge street, $3,500; H. S. Howland Sons, alt. to add. to warehouse, 136 Front St. W., $5,000; A. H. Garrett, 3 sty. brick theatorium, 2 stores & 3 dwellings, attached, 618 Bloor St. W., $12,000; James Gibson, 3 pr. semi-det. 2 1-2 sty. brick dw., E. S. Dovercourt, $18,000; R. A. Shields, 1 pr. semi-det. 2 sty. brick dwellings, 36-38 St. Clair, $4,500; H. E. Thomas, 1 pr. semi-det. 2 sty. brick dwellings, W. S. St. Clarens Ave., $4,000; H. Metcalfe, 2 det. 2 sty. brick dwellings, 496-498 St. Clarens Ave., $4,000; J. Rydall, 3 sty. brick carriage shop, on 527 Bloor St. W., $3,500; H. M. King, 1 pr. brick dwellings, E. S. Sunnyside, $4,600; Jas. Hepbourne, 1 pr. semi-det. 2 sty. brick dwellings, 302-304 Wallace, $4,000; G. F. Allen, 2 sty. frame dwelling, W. S. Munro Park Ave., $3,000; W. Howell, 1 pr. semi-det. 2 sty. brick dwellings, 2366-8 Queen E., $4,000; Parisian Laundry, 3 sty. brick addn. to laundry, N. W. cor. King & Portland, $11,000; L. Purdy, 2 sty. brick store and dwelling, N. E. cor. Leslie & Doel, $3,200; E. W. Wickham, 2 sty. & attic brick dwelling, near Queen St., on W. S. Beach avenue, $4,000; A. Henderson, 2 detached 2 sty. brick dwellings, near Bloor, on E. S. Brock, $5,000; A. H. Wagstaff, 2 sty. brick dwelling, near Gerrard, on W. S. Greenwood, $3,500; J. A. Love, 1 pr. semi-det. 2 sty. brick dwellings, N. S. Doel avenue, $5,000; Toronto Show Case Company, 2 sty. brick factory, E. S. Carlaw Ave., $32,000; Walker Parker Company, 4 sty. brick addition to factory, corner Wellington & Emily, $7,000; J. E. Peterkin, 1 pr. semi-det. 2 sty. brick dwellings, St. Clarens avenue, $4,000; Tompkins & Murphy, 1 pr. semi-det. 2 sty. frame dwellings, on 78-80 Kingston road, $3,000; F. H. Swallow, 2 sty. brick store, near Summerhill, on Yonge St., $3,000; A. A. Patterson, 2 sty. brick dwelling, on S. S. Radford, $3,600; W. R. Begg, 2 sty. & attic brick dwelling on Lynwood avenue, $6,500; W. Caldwell, 1 pr. semi-det. 2 sty. brick dwellings, 1064-1066 Dovercourt road, $4,000; G. D. Lovegrove, 2 sty. & attic brick dwelling and a stable, 4 High Park avenue, $6,000; G. E. Case, 2 det. 2 sty. & attic brick dwellings, E. S. Sunnyside, $7,000; Batts, Limited, 2 sty. brick carpenter shop, 374 Pacific avenue, $9,000; T. W. Robinson, 2 y-2 sty. brick dwelling, St. John & Lansdowne, $2,600; G. McWilliams, 2 sty. & attic brick dwelling, on 118 Armstrong avenue, $2,800; J. B. Zavitz, 2 1-2 sty. brick dwelling, S. S. West Marion street, $2,500; R. Rolson Company, 2 1-2 sty. brick dwelling, 317 Rusholme road, $4,000; R. S. Tickner, 1 pr. semi-det. 2 sty. brick dwellings, E. S. Dovercourt, $4,000; Watt Milling Company, 2 sty. corrugated iron lumber shed & carpenter shop, N. W. cor. orman & Osler, $4,500; James Kyle, 3 [illegible] ley, $7,600; W. P. Graham, 1 pr. semi-det. 2 sty. brick dwellings, E. S. Emerson, $4, [illegible] Fern, $7,500; N. Snow, 3 att. 2 sty. brick dwellings, 40 Wallace avenue, $6,000; A. E. Armstrong, 2 1-2 sty. brick dwelling, S. S. [illegible], Coltman & Pearson, 1 pr. semi-det. 2 sty. brick dwellings, N. S. [illegible], Jess Applegath, 2 sty. & attic brick dwelling, cor. Glen road & Hy[illegible]

Vancouver, B.C

A permit has been issued for the Bauer block, southeast corner of Hastings and [illegible] streets, $[illegible]. The plans have been altered, the foundation now existing at the corner having been erected on plans for a hotel block, while the revised plans contemplate an office building. The structure will be eight storeys in height, and of reinforced concrete type of construction. Other permits were as follows:—A. M. Sharp, 1616 Alberni street, $2,000; Mrs. G R. Maxwell, 355 Twelfth avenue, $4,500; G. Coulson, 524 Seventh avenue east, $2,600; E. J. Escott, 1537 Keefer street, $2,500; Capt. French, a six storey warehouse, Alexander street, between Carrall and Columbia, $24,000; Mr. H. G. Elliott, apartment house on Pendrill street, between Nicola and Broughton, $16,000; G. Stewart, 2237 Oxford street, $2,000; W. Cook & Company, 1523 Bismarck street, $2,000; J. Ferguson, 1136 Tenth avenue west, $4,500; Brackman-Ker Company, C. P. R. reserve, $3,000; W. Cooke, 1524 Bismarck street, $2,000; Bacon & Mugford, 2749 Memlock street, $3,000; Mark Knowlton, 829 Fourteenth avenue east, $2,500.

AWARDED.

Collingwood, Ont.

The Collingwood Shipbuilding Company closed a contract with the Playfair Company of Midland for a ten thousand ton steel bulk freighter. The contract calls for delivery in time for the fall trade.

Kingston, Ont.

The County of Frontenac awarded the contract for cement to W. B. Dalton & Sons, of Kingston, at $1.75 per bbl. Other tenders were: J. K. Spooner, Glenburnie, sand, at 80 cents per c. yd. on sleighs and $1 on wagon; accepted. A. Tait, Collinsby, crushed stone, at $1.15 per s. yd.; accepted. S. Anglin & Co., cement, at $1.90 per bbl.; rejected. W. J. MKendy, sand, at 95 cents. per yd; rejected.

Montreal, Que.

The contract for the erection of stables on Redpath avenue for Mr. C. J. McCuaig has been awarded to D. J. Loomis. Messrs. MacVicar & Heriot, architects, 104 Union avenue.

Toronto, Ont.

McColl Brothers were awarded a contract for engine oil required by the city at 24 cents per imperial gallon, while the Ontario Soap & Oil Company received the contract for cylinder oil at 40 cents.

Winnipeg, Man.

The tender of Messrs. Mussons, Lt for the squee-gees for street cleaning was accepted by the Board of Control.

W. O. Lee, Winnipeg, has been awarded the contract for the supply of cement at $6.405 per No. 100 ex. sacks.

St. Mary's Hardware Company, Limited, St. Mary's, Ont., J. Walter Pearl retiring.

James McFayden Lumber Company, Dryden, Ont., it is stated, has been succeeded by David Anderson.

The Annex Hardware Company of St. Louis, Que., whom we reported as having assigned in the issue of February 2nd, dissolved partnership in January last, and are still doing business under the above name and have registered accordingly.

New Companies

Kent Light, Heat & Power Company, Liimted, Chatham, Ont., incorporated, capital $300,000. Incorporators, G. H. Kilmer, J. A. McAndrew and W. H. Irving, barristers, all of Toronto, Ont.

The South Huron Telephone Company, Limited, Zurich, Ont., incorporated, capital $25,000. Incorporators, E. Zeller, publisher, B. A. Campbell, physician, both of Zurich, and others.

The Sharp Construction Company, Limited, Montreal, Que., incorporated, capital $50,000. Incorporators, W. R. Lerous, clerk, C. G. Mackinnon, J. T. Hackett, advocates, both of Montreal, Que.

The Montreal Electric Company, Limited, Montreal, Que., incorporated, capital $40,000. Incorporators, W. B. Shaw, electrical engineer, E. J. Gunn, electrician, and others, all of Montreal, Que.

B. J. Coghlin Company, Limited, Montreal, Que., capital $200,000, incorporated to carry on the business of manufacture of and dealers in iron, steel, railway and street railway supplies, etc., Incororators, B. W. Palin Coghlin, and G. K. Coghlin, merchants, N. J. Dawes, brewer, and others, all of Montreal.

Toronto Structural Steel Company, Toronto, Ont., capital $250,000. Incorporators, Andrew Dods and Mervil MacDonald, barrister, both of Toronto.

Woodbridge & Vaughan Telephone Company, Limited, Woodbridge, Ont., capital $10,000. Incorporators, Peter D. McLean and Charles L. Wallace, merchants, Woodbridge.

Victor Steel & Wood Products Company, Limited, Walkerville, Ont., capital $40,000. Incorporators, James Harmon Flinn, attorney, Ned. G. Begble and Franklin T. Chapman, manufacturers, all of Detroit, Mich., and Edward C. Kenning, barrister, Windsor, Ont.

La Campagnie des Carrieres Fetix Labelle, Saint Francois de Salles, Que., capital, $20,000, incorporated to carry on the business of building contractors. Incorporators, Esioff L. Patenaude, advocate, Louis J. Boileau, notary, both of Montreal, Que.

The Manitoba Gazette gives notice of a charter granted to the "Stonewood Flooring Co., Ltd., capital $40,000. The directors are A. K. Dysart, D. N. Wemyss, and others.

Business Notes

The Western Lumber Company, Montreal, Que., have dissolved.

F. Gilbert, contractor, Westmount, Que., is stated to have assigned.

Ferneld & Wilson, contractors, Montreal, Que., have dissolved.

James A. Moore, saw mill proprietor, Waterford, Que., deceased.

Lynch & Sharpe, contractors, Montreal, are stated to have assigned.

Western Lumber Company, Montreal, Leon Gagne, Jr., registered.

J. Morrison, contractor, Montreal, Que., is stated to have assigned.

Leclair & Bourque, lumber, Ely, Que., it is stated, have dissolved.

The Structural Tile Company, Montreal, Que., Jas. Stinson registered.

The Pearce Construction Company, Montreal, Que., have dissolved.

Robert Nicholson Lumber Company, Strathroy, Ont., Robert Nicholson, deceased.

Alexis Gagnon, contractor, Montreal, Que., is stated to have assigned.

Letourneau & Camire, lumber merchonts, D'Israeli, Que., have dissolved.

H. G. Wyatt, Armstrong, B.C,, has sold out his saw mill to T. K. Smith.

Claridge & Hillock, lumberman, South River, are stated to have assigned.

Olds Gas Power Company, Limited, Sherbrooke, Que., has been incorporated.

A. T. Short, Limited, Cobalt, Ont., lumber dealers is said to have assigned.

E. Authier & Company, contractor, Montreal, Que., is stated to have assigned.

Greenberg & Company, plumbers, Montreal, Que., Louis Greenberg registered.

Leger & Company, quarry dealers, St. Vincent de Paul, Que., have dissolved.

E. Brunet & Genest, contractors, Montreal, Que., are stated to have dissolved.

J. B. Reid & Company, contractors, Ste. Agathe, Que., Mrs. J. B. Reid registered.

J. J. Hislen, lumber merchant, Delmas, Sask., has sold to J. C. Mann & Company.

F. Nicolas & Company, electricians, Montreal, Que., Frank Nicolas registered.

Duranceau & Duranceau, bricklayer contractors, Ville Emard, Que., have registered.

H. Auclair & Company, plumbers and manufacturers, Montreal, Que., have dissolved.

Duquette & Denis, general contractors, Montreal, Que., Wilfrid Duquette and Jos. Denis registered.

Rodgers, Wray & Greenway, plumbers and tinsmiths, Grimsby, Ont., have dissolved partnership.

The Galvin-Watson Lumber Company, Limited, Wadena, Sask., it is stated, have been succeeded by C. A. Carpenter.

Canadian Sheet Steel Corporation, Limited, Morrisburg, are stated to have assigned to E. R. C. Clarkson, Toronto.

Frank Munro & Company, contractors, Montreal, Que. Michael Dohen, Leslie C. Thompson and Frank Munro have registered.

J. C. Graham Company, Limited, sash and door manufacturers, Winnipeg, Man., have increased their capital from $50,000 to $100,000.

Simpson Brick Company, Toronto, Ont., succeeded by Hamilton Brick Company, Limited. Business will be continued in Toronto as a branch.

The B. C. Gazette gives notice of the incorporation of the following companies:—The Elko Water, Light & Power Company, Limited, capital $40,000; Fort George and Alberta Telephone & Electric Company, capital, $250,000; National Paper Mills, Limited, capital $250,000; the Portland Canal Water & Power Company, Limited, capital $25,000; the Prince Rupert Telephone Company, Limited, capital $25,000; International Eelectric Company, Limited, capital $1,000,000; Pioneer Lumber Company, Limited, capital $75,000; Cunningham-Sanderson, Limited, incorporated to carry on a general hardware, building or contracting business, capital $35,000; the Hodgson Plumbing & Heating Company, capital $25,000; Merritt Water, Light & Power Company, capital $25,000; the Standard Hardware Company, Limited, capital $30,000. The B. C. Gazette also gives notice of the granting of the following license:—The Canadian Heating & Ventilating Company, Limited, head office, Owen Sound, provincial office, Vancouver, capital $200,000.

We Have Always in Stock:
at all our yards

Crushed Stone

and

Crushed Granite

For Fireproof, Sidewalk or Road Construction

Cement Building Stone Builders' Supplies

C.P.R., Grand Trunk, M.C.R. and T.H. & B. Railway Delivery.

ROGERS SUPPLY COMPANY

Head Office: 3 King Street East, Toronto
Phone Main 4155

YARDS;
Foot of Berkeley St.
Foot of Bathurst St.
Foot of Church St.
256 Lansdowne Ave.
C.P.R. Crossing North Toronto
G.T.R. Crossing Pape Ave.

Creosoted Wood Paving Blocks

cut from the log in our own mills out of live Douglas Fir and creosoted to specification as to Oil and Pressure. Capacity 1,000 yards per day.

Bridge, Structural and Mining Timbers

cut and sized to exact dimensions, and if so desired, framed in our yards before Creosoting.

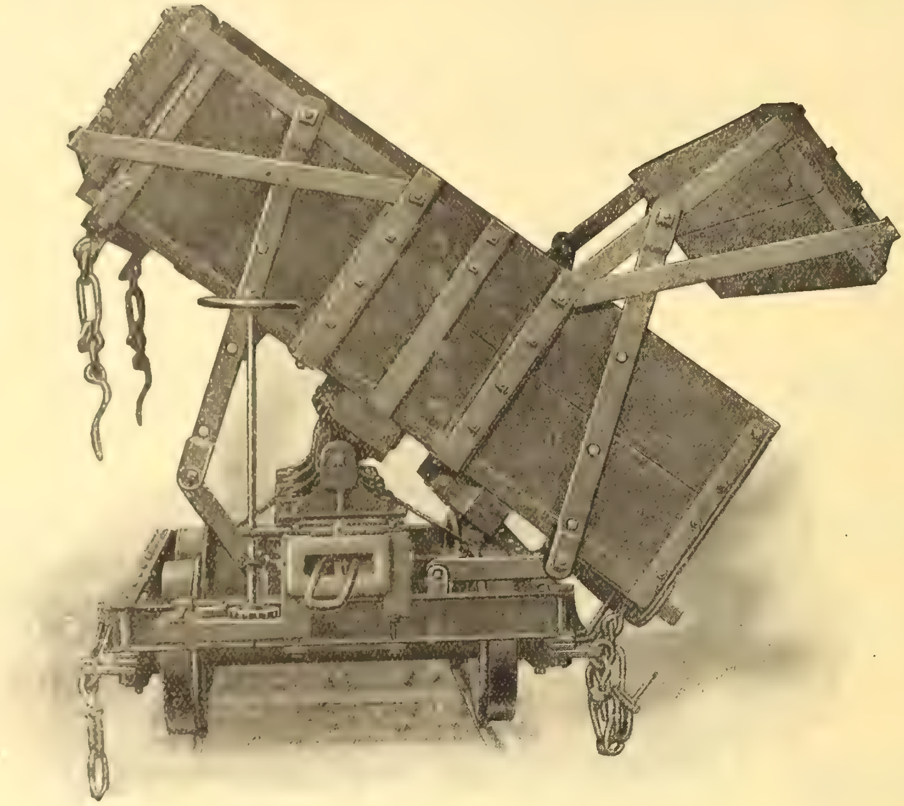
Standard Creosoted Railroad Ties

Capacity after March 1st, next, 1,200 ties per day.

Dominion Carbolineum Works Limited

Vancouver, B. C.

DUMP CAR



All Capaciti

All Gauge

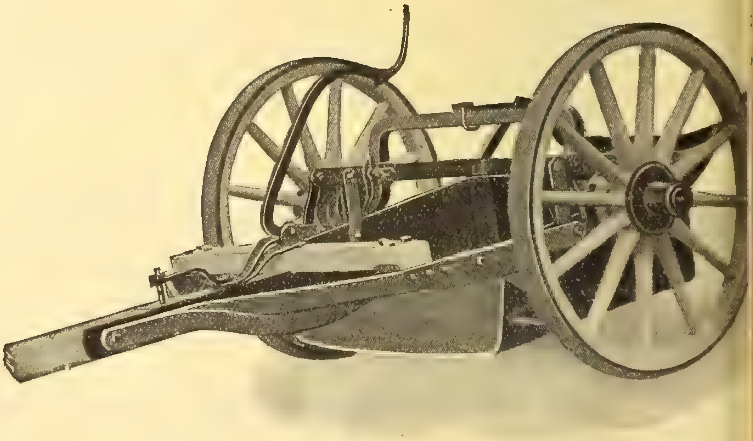
Promp Shipme

Scrapers
(Wheel and Drag)

Plows

Graders

Locomotives



Head Offices and Warehouses:
Montreal

MUSSEN

owing are offered for immediate sale at reduced prices. Quotations will be forwarded promptly on application :—

—45 ton Bucyrus Steam Shovel, 1½ yard dipper, in good condition; very low price.

—No 1 Smith Concrete Mixer, mounted on truck with gasoline engine, good condition.

—No. 1 Smith Concrete Mixer, mounted on skids with engine. Practically new machine. Has new drum and new gears. Engine thoroughly overhauled. New boiler and wheels could be attached, if desired, to suit buyer.

—35 ton Vulcan Steam Shovel (new) 1¼ yard dipper.

3—No. 4 Austin Jaw Crusher, mounted on heavy wheels for portable work. Practically a new machine.

—New Battery Wire Screen, 40 ft. x 17 in. No. 60 mesh.

—25 H. P. Vertical Boiler fair condition, low price.

—2 Selfrighting, Self Locking, Concrete Buckets, 1 yard capacity.

1—Stiff Leg Derrick, 50 ft. boom with bull wheel and swinger, blocks and complete fittings.

3—Large Plate Shear, No. 31

4—Large Lever Punch, portable No. 4 with 16 bevel dies, 13 flat dies and 30 punches, punches 1 inch round hole in 1 inch plate, fine condition.

6 No. 3 "Canada" Wheel Scrapers in first-class condition.

1 Old Chain Block.

1 12 inch Single Wire Rope Block with Hook.

2 12 inch Single Wire Rope Block with Shackles.

1 10 inch Single Wire Rope Block with Hook.

25 B. & R. Car Movers, (new).

1 Pair Johnston wrecking frogs (new).

No. 729—Centrifugal Drier. —Centrifugal Drier, copper basket, phosphor bronze foot and bearings. Capacity about three tons per hour, 850 R. P. M. Countershaft brackets and pulleys included, all in perfect order. Brake only missing.

No. 840- Rubber Belting.—I Roll 6-ply Rubber Belting, 14 in. wide x 71 feet long, branded "I. P. Harris Patent North British Rubber Co. Edinburgh."

No. 841—Battery Screens.—24 Slotted Screens 15 in. x 52 in. 60 mesh.

No. 842—Battery Screens—Diagonal Slotted Screens, size 14 in. x 51 in.

No. 843—Battery Wire Screen.—1 Roll 50 mesh Battery Wire Screening 18 in. wide x 10 feet long.

No. 844—Twist Drills.—Standard Tool Coy's straight shank twist drills, 9/16 in. to 1 1-4 in.

1—9/16 in. 36c each net cash
2—5/8 in. ....42c " "
1—3/4 in. ....56c " "
1—13/16 in ....65c " "
1—7/8 in........ ..74c " "
1—1 in .96c " "
1—1-1/8 in ....$1.14 " "
1—1-1/4 in $1.35 " "

Lot of samples conveying machinery and elevator buckets.

Lot of dump car irons.

20 Axles 21 in. long.

Lot of Emery wheels.

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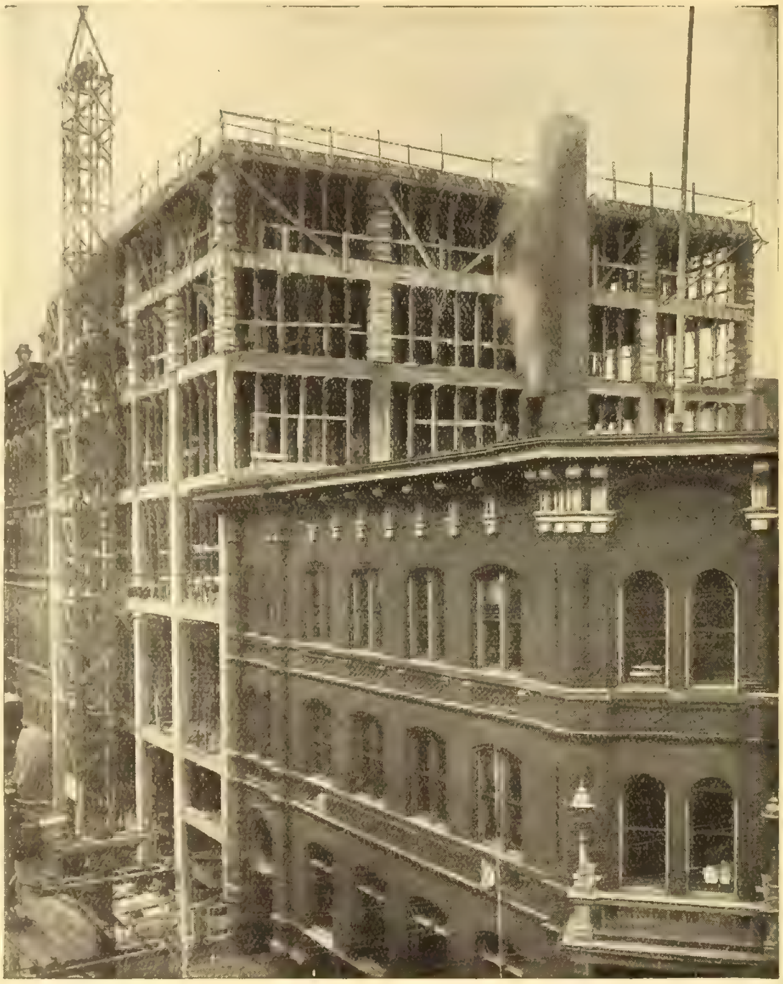

Cut shows Reinforced Concrete Building under construction for the Thomas C. Watkins Departmental Store, Hamilton.

Some Users:

Winch Building,
Vancouver, B.C.

Victoria Sheds,
Victoria, B.C.

Petrolea Bridge Co.,
Petrolea, Ont.

Filtration Plant,
Toronto, Ont.

Thomas C. Watkins
Hamilton, Ont.

Halifax P.O.,
Halifax, N.S.

Dominion Exp. Co.,
Ottawa, Ont.

Erindale Power Co.,
West Toronto.

Dominion Concrete
Co., Kemptville, Ont.

Some Users:

Joseph Vincent,
Union, Ont.

Robert Simpson Co.,
Ltd., Toronto.

Murray Shoe Co.,
London, Ont.

Septic Tanks,
St. Thomas, Ont.,

Septic Tanks,
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Fair Play in the Contracting Field

One of the most potent factors in the affairs of men is the principle of fair play. Upon a strict observance of this principle depends, absolutely, the success of the individual or community. Taking it for granted that the disposition of the majority is in accord with this sentiment, and that, in business life, it is the desire of the majority to offer a fair field to all who are rightly and legitimately entitled to compete with them, one is somewhat at a loss to understand the action of such a responsible body as the Toronto city council in awarding a large contract for cast iron pipe to a local concern, in face of a tender, over $200 lower, from a Glasgow firm. It impresses one as being a violation of the aforesaid principle, and to him who looks a little further ahead than the rest, must occur the question: "How can we hope to maintain satisfactory relations with the British manufacturer if we accord him such scurvy treatment?" It is manifestly unfair to call for bids from all quarters and then ignore those from outside sources. If Canadian firms, and Canadian firms only, are desired to figure, surely it is only common decency to advertise accordingly.

When the award in question was under consideration the argument was adduced that it would be more satisfactory to have the pipe manufactured in Toronto, under the supervision of the city, than have to put up with a "Scotch inspection." This assumes either inability on the part of the great British firms to complete an order according to given specifications or else a certain amount of incompleteness and ambiguity in the specifications themselves. Neither of which suppositions, happily, are to be taken seriously. In some instances it is perfectly apparent that the best interests of the city would not be served in the acceptance of the lowest bid, and it is possible that there may have been some good reason for the rejection of the Glasgow firm's tender; but in all such cases [illegible] on the square, there must be a proper explanation made. In the award under discussion no elucidation is given, and the only conclusion to be reached by the outsider is that the city was actuated entirely by local sentiment.

As for the precedent established, it is a dangerous one and tends to monopoly. Under such conditions outside competition will cease to exist in a very few years. Is it to be expected, for instance, that the rejected firm in this case will waste time computing further tenders? The expense incurred and time involved in estimating is a vital consideration with such a concern, and they are too wide-awake to compete where failure is a foregone conclusion.

We cannot afford to cut off outside competition, and at this stage of our history, at any rate, discrimination against the British manufacturer is particularly ill-timed. We need his competition and we want him to compete with us in a fair field where no favors are given other than are compatible with reason.

Obscurity of Brick Interests

In these days of competition one cannot help wondering how it is that the brick manufacturers are contented to remain in such an obscure position as regards publicity. Surely the energetic manner in which the Canadian Cement & Concrete Association is working in the interests of the convention and exhibition at London, March 29-April 1, should provide them with food for reflection. The cement users are entitled to much credit for their enterprise. They have developed business in a manner that compels admiration and they have shown themselves to be business men as well as manufacturers. On the other hand, there has been an inclination on the part of the great bulk of the brick people to evade vigorous competition and offer a sort of passive resistance to the oncoming of their aggressive rivals.

Active competition of the kind put up by the cement people must be met with a similar policy. Where charges are laid against an article, they must be met and disproved if the article is to remain a negotiable factor in construction. We do not hold a brief for the brick manufacturer. Rather is this intended as a friendly criticism of the position in which he is contented to remain. And we do not attempt to extol the merits of brick. Indeed, so obscure have the manufacturers of the article allowed it to become, that one is tempted to ask whether it has any merits at all.

During recent years constantly increasing attention has been given to the selection of materials of construction. Availability, cost, durability, fire resisting qualities and the general properties of materials of construction are now carefully considered in the preparation of designs for the majority of structures, and to this fact, doubtless, is due partly the increased use of concrete and the decline in brick. But in all this we are influenced by the argument of those interested in concrete, and this is only natural, for it is their side of the story that we hear the most.

Permits issued at Lethbridge, Alta., during 1909 [illegible] an increase of no less than [illegible] per cent. over the total for 1908 which was [illegible]. [illegible] the prospects for the current year Mr. H. W. [illegible], building inspector, says: "Prospects for the coming year could not look better. There is a good demand for all kinds of accommodation, and with a large influx of settlers expected in the spring, it is only reasonable to suppose that the building of 1910 will be considerably greater than that of 1909."

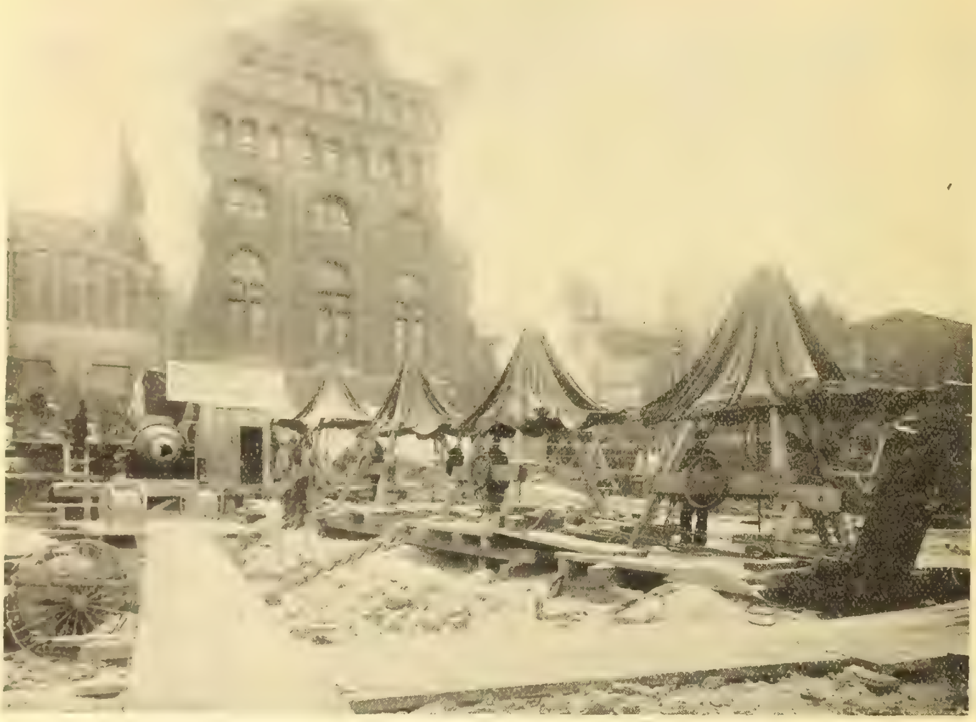
Interesting Methods in Foundation Work

As Employed by the Contractors at the New Windsor Street Station, Montreal—Introduction of the Chicago System

The extensive contract for the construction of foundation for the new Windsor Street Station, which is being carried out by the Bishop Construction Company, of Montreal, associated with the New York Foundation Company, embodies the use of interesting methods which have not been previously employed in Montreal.

The new Canadian Pacific Railway station will front on Windsor street, just south of the present Windsor street building, and together with the train sheds which will be erected, will occupy an area of approximately 65,000 square feet. The early construction was placed under way by Contractor C. E. Deakin, of Montreal The present contractors commenced operations on the completion of the work about November 27th last. It was the wish of the railway company to finish the foundation work in time to commence the general contract of erecting the station in the spring. In furtherance of this an arc lighting system was installed on the premises and the work has been proceeded with steadily day and night throughout the winter months.

The method adopted by the contractors in sinking the open caissons for the concrete piers is, as before stated, new to Montreal; in fact, it may be said that the system is practically new to Canada. What is known as the "Chicago method" of foundation construction has been used for the most part, and this has proved a very satisfactory way of sinking the caissons. For this work two-inch spruce sheeting, tongued and grooved to a bevel, is used, the method of procedure being to dig a circular hole, of varying diameter, depending on the stress which the pier would eventually have to carry. When a depth of six feet is reached, the sheeting is placed tightly in position and firmly fastened, about one foot from each end, with two wrought iron bands. These bands, three inches wide by half an inch thick, are in two sections and are firmly bolted into the required positions. With the first six feet of sheeting in place, the work of excavating another similar section is proceeded with. This process is continued until solid rock is reached. Under this method of construction the diameter of the hole remains the same at both top and bottom. On completing the caisson, the work of concreting is commenced and the iron bands are gradually removed as their usefulness gives place to the solid concrete.



Showing the novel Method of Procedure Adopted by the Bishop Construction Company in the Foundation Work for the New Windsor Street Station, Montreal.

In removing the earth from the pits, a series of driving engines are employed and around these are passed a system of endless cables. In turn, these cables are passed around a chieve keyed to the end of a shaft. This shaft is held in position by a tripod standing approximately twelve feet high, with legs fixed about eight feet apart on the ground. To the top of the tripod a snatch block is attached and the buckets containing the earth

General View of the Site of Operations

are hoisted by means of a rope passed over a nigger head. keyed to the constantly revolving shaft. As a rule, each driving engine is arranged to operate a row of eight tripods, and by this means an efficient method of raising the excavated earth is arranged for. These tripods are erected on platforms which cover the entire area of the hole.

Occasionally, sections of ground were found where the Chicago method could not be employed on account of the soft nature of the soil. In these places it was necessary to resort to the ordinary method of driving the sheeting into place. For the latter style of caisson. Georgia pine sheeting was used. At the lower south end. where it was found necessary to place two piers quite close together, one large square caisson, with dimensions of about 20 feet by 8 feet, was sunk.

The question of contending with the water (apparently the seepage from the mountain) which drained into the holes, proved an important factor of the work. Two sump pits were constructed when the work of construction was commenced, and it has been found necessary to keep hydraulic pumps in continual operation. For this purpose alone, about 75 horse power is required. In special cases where the infiltration of water proved a serious drawback, the steam syphon method of removing the water was resorted to and in that manner the engineers overcame their difficulty.

Showing One of the Five Square Caissons Sunk for the Foundation Piers.

In all, the Windsor Station contract includes the construction of 245 piers, which have averaged a depth of 55 feet. At the present time about 230 of these piers have been finished, and the work of the foundation contractors is rapidly nearing completion. The concrete mixture used, varied with the nature of the calculated stresses upon the piers. For the train shed piers at the west end of the site, the concrete consisted of one cement, three sand and six stone, while for the more important station piers, one cement, two sand, and four stone was used.

Valuable Papers at the Good Roads' Convention

The ninth annual convention of the Ontario Good Roads Association, which was held in Toronto, March 2-4, was attended by upwards of 400 delegates. The programme of papers was a most extensive one. A selection of those of the greatest interest to our readers will be found elsewhere in this number. Particularly interesting are the comparisons of steel and concrete bridges. The respective merits of these structures were discussed very ably by Messrs. Frank Barber, C.E., County Engineer of York; A. W. Connor, C.E., Toronto, and Jas. A. Bell, St. Thomas, Ont., City and County Engineer. The cost data on road building, given by Mr. C. R. Wheelock, Orangeville, Ont., Engineer of Peel county, also furnishes information of considerable value to those connected with municipal work of this kind.

At the election of officers at the Friday session, Mr. W. H. Pugsley, of Richmond Hill, Ont., was elected president; Mr. Thos. L. Kennedy, of Cooksville, vice-president, and Col. J. E. Farewell, Whitby, Ont., secretary-treasurer. The executive was chosen as follows: Messrs. R. H. Jupp, Orillia; J. Hall, Prescott, Ont.; H. W. McKay, County Clerk, Elgin, Ont., and L. A. Hamilton, Lorne, Ont. Next year's convention will again be held in Toronto in the first week of March.

Changes from Specifications

Among the most annoying features in connection with the building industry are the changes that are so frequently demanded of a contractor in the erection of a structure. These are so wide in character, and at times so unreasonable, that there is some cause for the builder to grow impatient and become worried at the manner of the average owner. There is cause for this seemingly unreasonable action, and this can in nearly every instance be attributed to the lack of adequate knowledge that the owner possesses with regard to such matters. There are, however, some people who are not content with anything, and who can never be pleased with what they contract for, even though the plans be made after their own ideas.

There are some difficulties at times that are not calculated to improve the disposition of the contractor, and still these must be met and acted upon in a reasonable way because there is hardly any way to escape them. Let us take the average home builder for instance. Many of them have at least a fair idea of what they want in the line of a house. These ideas are sometimes formed from printed plans, from another house they have admired, or from their own preconceived ideas of what will be both modern, convenient and still not be above the average cost for such structures. Sometimes, they are deceived in the actual cost of a structure.

from an ignorance of such undertakings and a lack of definite knowledge as to the cost of either labor or materials.

One cause for this state of affairs is due to the fact that to-day we find many plans and estimated costs being published in literary magazines that are in many instances very much at variance with the actual cost of such buildings. These plans, while they are legitimate in so far as they go, do not make possible the cost in all sections of the country, and what can be had in one locality at a stipulated price for either labor or material cannot be obtained in another section. Then the market on materials is continually undergoing changes, and these have to be considered by the prospective builder, and may make a considerable difference in the ultimate cost of the structure. In many cases, to make them attractive, the price is put very low, and there is not enough allowed for either materials or labor, so that the builder will be deceived when the actual cost is shown him.

It seems to be a serious error to continue publishing plans that are impossible, from the standpoint of actual design, as some are, and from the point of economy, which is apparently the chief object of the idea. Where the plans are published in a trade magazine, a publication that goes into the hands of the trade only, there is little danger of there being any unpleasant experiences from the above sources. The average contractor can easily ascertain the accuracy of the estimated cost of such buildings, and can apply the same to the conditions that obtain in his locality. He is not infrequently benefited in this way, as the plans make possible to him some newer ideas that he has not been able to work out himself.

There are some safe rules that can be followed to advantage by every contractor and builder, and these should be noted and heeded, that he may be enabled to offset difficulties that are at times not of the most affable nature. If a prospective builder comes to you with plans for a home, particularly if they have been secured from an advertised estimate, be sure to go carefully over the items, and to make no estimate yourself until you have studied the same in every particular. There is quite likely to be a difference in your figures and those advertised, in favor of the latter, but this will forewarn the prospective customer that he has been deceived, and that it will be impossible to construct the building at the advertised price. The difference in cost can be explained and this will obviate any differences that might arise when the work has been undertaken at a stipulated price. This is a safe rule to adhere to, and one that should be noted by every contractor in advance.

Then you should have it understood that the number of changes, should there be any, aside from what are specifically stated in your contract, are to be paid for at a reasonable price.—Warfield Webb, in the "National Builder."

Concrete Highway Bridges

"Concrete Highway Bridges" was the topic of an interesting address at the recent Good Roads Convention, in Toronto, by Mr. James A. Bell, C.E., St. Thomas Ont., City and County Engineer. At the outset, Mr. Bell made a comparison of the respective merits of steel and concrete bridges. The modern steel bridge of riveted structure, with concrete flooring, is, in Mr. Bell's opinion, the best steel bridge that can be built. Mr. Bell pointed out that an important factor to be taken into consideration is the cost of maintenance. The steel bridge requires care and attention and painting every few years, whereas this is not necessary in the case of the concrete structure. There is another point. The steel bridge is at its strongest the day it is opened for traffic, whereas the concrete is then at its weakest and improves afterwards. Mr. Bell said that the question of reinforcement has revolutionized concrete bridge construction. Many bridges can be erected of concrete and steel and not of concrete alone. This applies particularly to beam and flat top bridges.

The necessity for perfect foundations, particularly in arch bridges, was emphasized by Mr. Bell, who pointed out that beam bridges of 40-foot span and under can be constructed at less cost than arch bridges. The same degree of care is not essential in the foundation work for the beam bridge. A slight settlement in this class of structure is not of any great consequence, but would be disastrous in the case of an arch bridge. Speaking of flat top bridges, Mr. Bell contended that properly reinforced, this class of structure can be employed up to 16-foot span.

Mr. Bell emphasized the need for proper inspection in the erection of concrete structures. Men placed in charge of this work should have an intimate knowledge of the strength of cement and of the method of working it. They should be well posted on the various materials used under their supervision and be able to read plans satisfactorily. Mr. Bell gave an instance from his own experience. Quite recently two contractors approached him and said that they would be able to submit a lower figure on a certain concrete structure if they had the assurance of a qualified man to inspect the work. Asked as to where qualified inspectors could be obtained, Mr. Bell expressed the opinion that third year science men were the most successful and desirable for the work

Another phase of the subject discussed by Mr .Bell was the desirability of studying artistic effect. Strength and utility were certainly important features to be considered, but it was most desirable to have a "thing of beauty" as well.

In regard to the mixing of concrete, Mr. Bell pointed out how essential it is to have proper quantities and the right consistency, so as to ensure a perfect adhesion between the concrete and the steel. Where this is obtained, the concrete is practically waterproof; otherwise, the water percolates through, rusts the steel and minimizes the strength of the structure.

Mr. Archibald McGillivray has been appointed Good Roads Commissioner for the Province of Manitoba.

Mr. E. I. Sifton, city electrical engineer of London, Ont., has resigned. Mr. D. P. Roberts, assistant engineer, has been appointed temporarily to the position.

Fernie, B.C., was practically rebuilt in 1909, and extensive building operations are planned for the present year. The construction of 1,000 additional coke ovens has been mooted. One, and possibly two, of the wholesale business houses will increase their warehouse capacity. There will probably be many improvements of public works and the Dominion estimates make provision for a new armory building. A separate high school will be guaranteed next September.

The legal department of the British Columbia Electric Railway has received instructions from the management to proceed in the courts against a firm of contractors at New Westminster, who were engaged on municipal improvements and who, it is alleged, fired a blast that broke a high tension wire, damaged a transformer to the amount of $2,000, and by so doing deprived the city of light and power for an entire day. The company states that its employees were not notified to be on hand and the proceedings will take the form of criminal as well as civil action.

General View of Works from Transmission Line, in the Winnipeg Municipal Power Development Scheme

Winnipeg's Power Development Progress

The work upon the city's power site at Point du Bois was begun under contract of Feb. 3rd, 1909, previous to which date the site only had been cleared, and 25 miles of standard gauge railway had been built to provide proper access. Fairly good progress has now been made on the canal excavation and on the construction of the concrete dams, and, since the beginning of winter, the work of closing the river by means of a rock fill has been prosecuted, and already the upper waters have been raised several feet. The natural elevation of the upper river will be raised, by the permanent works, 13 to 15 feet, giving to the total waterfall developed a head of 45 feet net, all hydraulic clauses having been considered.

Excavation for Power House

The construction of the power house has been carried on since November within a huge frame shed, and the concrete foundations which have been laid to date have been placed under conditions almost ideal for this work. The contractors, who are manufacturing the equipment, are making energetic progress, and it is expected that deliveries of machinery will begin in August next.

The transmission line construction is fairly well under way. Nearly all the towers will have been delivered by the end of February. The contractors in charge of the erection of the transmission system are prosecuting their work with diligence, and this winter are engaged upon these portion of the right-of-way which cross the swamps, and other districts inaccessible in other than winter weather.

Air Locks in Water Pipes

*

The effect of the sagging of a lead pipe between its supports, is that air will collect in the high parts of the bends, and will form air locks. These air locks will greatly impede the flow of water through the pipe. If the pressure is light, and the sags are many, they may stop the flow entirely. A long waste pipe suffering from these conditions might utterly prevent the passage of water and give the impression that it was choked by refuse, while, as a matter of fact, the real trouble was due wholly to the air locks which had formed.

If air has accumulated in the upper bends, the water will rise on one side of the bend and slightly compress the air which has been entrapped at different points. The air will depress the water on the other side of the bend and raise its surface at the next upper bend. The difference in level between the surfaces of the water on the opposite sides of a bend, is the measure of the resistance which the air in that bend offers to the passage of the water in a steady flow. The effects of the air accumulation are chiefly observed in low pressure systems, such as those which are supplied with water from house tanks.

The reason for this is, that the pressure due to the head between the air locks and the tank is usually too low to force the air out of the pipe. It is different when the system is under high pressure, because then the pressure is generally sufficient to force the air out of the pipe with the water. A common cause of air lock in a building is the running of a lead hot water pipe over the beams for a considerable distance, the pipe not being supported uniformly throughout its entire length.

City of Winnipeg Power Development Showing Partially Constructed River Wall

A Proposed Standard for Cast Iron Pipe

Leading City Engineers Practically Unaninious in their Approval of the Suggestion—An Opportunity for the Manufacturers to Express their Opinions

As a result of an interesting discussion at the recent annual convention of the Canadian Society of Civil Engineers, a committee of that body was appointed to frame standard specifications for cast iron water pipe and to report to the council of the institution. The question is one which is of considerable import, and with a view to stimulating further interest in the matter and to bringing the proposal more nearly to an issue we have ascertained the opinion of leading engineers, extracts from whose communications are reproduced below. The subject should provide an interesting discussion for many of our readers. We trust that some of the manufacturers will also send us an expression of their views for publication.

C. H. Rust, City Engineer, Toronto, Ont.:—

"I certainly think it would be an excellent idea, not only for the profession but also for the manufacturers, if a standard specification for cast iron pipe were prepared. The New England and American Water Works Associations have one which is generally used by engineers and municipalities in the United States."

A. F. Macallum, City Engineer, Hamilton, Ont.:—

"In this city we lay no size less than 6-inch, weighing 360 pounds per length; our 12-inch weighs 960 pounds per length, and our 18-inch 1,800 pounds per length. Within the limits of pressure that we have been working on here, we have had very few breakages using these weights, and although they are somewhat lighter than used in other cities—especially some of the western cities—yet these are, in my opinion, of weight sufficient for ordinary fire pressure. As many of the municipal engineers are members of the American Water Works Association, they would naturally adopt the specifications as gotten out by that association, and, personally, I do not see the necessity for any further specifications."

Newton J. Ker, City Engineer, Ottawa, Ont.:—

"At the recent meeting of the Canadian Society of Civil Engineers in this city, a committee composed of Owen W. Smith, Toronto; E. A James, Toronto; T. C. Irving, Jr., Toronto; R. S. Lee, Montreal, and myself, as chairman, was appointed to report upon the standardization of the specifications for cast iron pipe and special castings. We are, at present, taking the matter up and before reporting are endeavoring to ascertain the views of the different pipe manufacturers in reference to the standardization of the specifications. Until the manufacturers' views have been received and carefully considered, the report will not be sent on to the society. I may say, however, that we are in favor of adopting the standard specifications of the American Water Works Association with some amendments."

J. Antonisen, City Engineer, Port Arthur, Ont.:—

"I am prepared to support your efforts in regard to the standardization of cast iron pipe. The New England Water Works Association adopted a standard for water pipes a couple of years ago, which is as complete as could be desired. Dr. Johnson's standard book on specifications, contains a set of specifications for cast iron pipes as used in Philadelphia, which seems to me to cover all the necessary points.

"In drawing up standard specifications for use in Canadian cities, it would be advisable, I think, to consider the standard specifications used in Scotland, as the factories in Glasgow have a world-wide fame for the excellent quality of their pipes, and supply a large amount to Canada. Our Canadian Society of Civil Engineers, aided by representatives of Canadian foundries, would have no difficulty in deciding upon a standard, with such good models to guide them as the above mentioned."

James Hutcheon, City Engineer, Guelph, Ont.:—

"I am in sympathy with the proposal to adopt standard designs for cast iron pipe. The adoption of a well considered series of designs will simplify the work of both the engineer and the manufacturer, and at the same time give the assurance that the materials supplied will meet the requirements for which they are intended.

"The adoption of such standards can never be made more easily than at the present time, for new difficulties and objections are sure to arise as our towns and cities increase in population. The work of standardizing should not be confined to water pipe alone, but should extend to hydrants and hose connections, so as to make these interchangeable throughout the country.

Jas. A. Bell, City Engineer, St. Thomas, Ont.:—

"I am strongly of the opinion that a standard specification for cast iron pipe would be a good thing. My experience has shown that in numerous instances pipe will not fit the specials and leave enough room for making a good joint. This is particularly the case when you are dealing with different manufacturers. There is a standard specification published by the American Water Works Association, in the proceedings of 1908, which appears to me to be very full and complete."

James C. Lindsay, City Engineer, Belleville, Ont.:—

"I consider this proposal opens up a large question. Whilst superficially a general "standardization" might appear a good thing, I can see difficulties ahead in the uniform process of manufacture."

Wm. Murdoch, City Engineer, St. John, N.B.:—

"A standardization has been reached by the New England Water Works Association and applied to that region of the United States. Although I am a member of that association, I do not concur, for the reason that different engineers have different views as to what they require. My own, for instance, are that all pipes should be cast on this continent as they are cast in Great Britain, namely, with the socket end down and a sufficient mass of metal left on the spigot end in which to accumulate all of the scoria, gases, etc., which rise to the surface of the metal after being cast; this mass to be turned off in a machine and each pipe given an exact length. This is not the case in the United States. An allowance is made for the cutting off of bad spigots and bands are permitted to be placed on the remaining spigots. Other cases are apt to occur as to thickness of metal required, etc., and in such cases the engineer would have to draw up his own specifications. For this reason I am of the opinion that every engineer should prepare his own specifications.

"I have never had any difficulty in obtaining pipe according to my specifications, but I always arrange with an inspecting firm to supervise the manufacture of the pipes and see that they are strictly according to requirements."

Comparison of Steel and Concrete Bridges

Relative Merits and Adaptability of either type Unreliability of Cost Data — Notable Examples of Concrete Arches*

By Frank Barber, of Barber & Young, Bridge and Structural Engineers, Toronto

A comparison of steel and concrete as materials of construction will show that these materials are to a great extent complementary: yet the contest which has waged between the rival advocates of the two has been very bitter.

Points For and Against Structural Steel

The qualities which have helped structural steel to attain its present position as a building material for bridges are, first, great strength for a given weight and cost both in compression and tension; secondly, uniformity; thirdly, the fact that most of the work can be done in the shop, where conditions are best and where inspection is easy. Again, since comparatively little work remains to be done in the field, erection of the steel at the bridge site is a short and simple process compared to the building of a concrete bridge. Some kinds of steel bridges are erected altogether without falsework. This applies particularly to the suspension bridge and to the cantilever (except for the anchor arms) but steel arches and even simple trusses are often erected as cantilevers without centering. But even where falsework is used it is light and simple for steel, compared to that required for concrete. Moreover, if the centreing settles to a slight extent it would probably be of small consequence in the case of a steel span, but it would be fatal to concrete.

But the great disadvantage that concrete suffers in comparison with steel, of having to be entirely manufactured on the ground often over a treacherous stream, has a redeeming feature, for almost the entire amount expended for the building of a concrete bridge remains in the community where it is built.

I have mentioned some of the undoubted good points of steel, but it is a remarkable fact that what has popularized steel as a material of construction probably more than anything else has been the widespread belief, first, in its great durability, and secondly in its fireproof qualities, neither of which has a basis in fact. We know now that unprotected steel columns in a building will often buckle with heat in a few minutes after a fire breaks out, and even when protected by tile experience has shown that they are not safe. However, fireproofing is more important in buildings than in highway bridges. As to the other supposed attribute, durability, twenty years ago when county commissioners built a steel bridge the belief was fairly general that it would be used by their grandchildren, whereas very many steel bridges erected 15 or 20 years ago are now showing signs of old age. In this connection it may be of interest to mention that the Government of New Brunswick, where wood is still plentiful, has recently discarded steel and reverted to wooden bridges for all spans up to 180 feet, the claim being made that covered wooden bridges will outlast steel and will cost less for maintenance.

It is a fact, however, that there are many steel bridges which were built 40 and 50 years ago which are still in good condition.

The comparatively short life of the majority of steel highway bridges in this country is due to a variety of causes. Doubtless the steel bridges of the future, partly on account of the rivalry of the more lasting concrete, will be more durable than they have been in the past. Buyers of highway bridges will take a hint from the method followed by the railway companies and will require strict inspection of their steel at every stage of its fabrication in the shop and erection in the field. They will learn to refuse corroded material which under present methods results from being thrown in a stock yard open to the weather, without painting or oiling. They will learn to refuse cheap oxide paints, which are very often used on highway bridges at the present time.

Some Advantages of Concrete Bridges

Concrete has none of the good qualities which I have mentioned as pertaining to steel, the chief of which were great unit strength and ease of erection, at least not to the same degree. In spite of this it has become a formidable rival of steel except for bridges of very long span. This is due to great durability more than to any other one thing. Concrete instead of deteriorating, becomes stronger with age. As you all know, examples of concrete construction remain to-day which were built 20 centuries ago. This argument is worth a host of others.

As to the structural features of concrete, it is economical for resisting compressive stresses; for instance, a concrete column can be built for about one-half the price of a structural steel column which would bear the same load. But concrete is not suited for resisting tensile stresses, that is it cannot of itself sufficiently resist forces which tend to pull it apart. It must have recourse to its hated rival, steel, to help it to bear tension. Steel thus combined with and embedded in concrete takes on the quality of permanence which it lacks in itself, for the concrete preserves the steel forever from corrosion.

Unreliability of Cost Data

It attempting to compare the costs of concrete and steel bridges, anyone but a specialist is likely to fall into errors. Some people even suppose that the cost of a bridge should vary as the span, and that a 50-foot bridge in one situation should cost much about the same as a 50-foot bridge anywhere else. But for one thing, the height of the roadway from the foundations has in general more to do with the cost than has the span. As an example, consider the following bridge: concrete abutments, wings and floor; span, 100 feet; roadway, 16 feet; heavy lattice hand guard; floor, 12 feet from the water and foundations 6 feet below it; designed for a 10-ton roller and a herd of cattle as live loads. It would cost, in general, about $50 to increase the span one foot, and about $150 to raise the floor one foot. But leaving out of consideration the abutments and considering the steel superstructure only, many are inclined to the opinion that a bridge with given main dimensions could be designed in only one way, and that, for instance, the bridge just referred to [illegible] design it. Now, I can tell you of a bridge of 90 feet span, 16 feet roadway, with a concrete floor, in which the structural steel weighs 30 tons, and of another of the same dimensions [illegible] than half as much, and others of intermediate weights could easily be found. The first bridge with proper painting will [illegible] in another are 10-inch at 25 lbs., and in a third are 12-inch at 31½ lbs.

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* Read at the Annual Convention of the Ontario Good Roads Association.

This variation in weight is due, first, to designs being made according to different specifications. The Dominion Government specification, for instance, allows a unit tensile stress in medium steel for dead loads of 16,000 pounds, and the Ontario Government specification allows 24,000 pounds per square inch. Even when bridges are designed and detailed by the contractor according to one specification the weight will vary considerably, partly because one designer will know better than another how to take advantage of the weak points which undoubtedly exist in all specifications. Even when a specification is rigidly enforced in the design by the buyers' engineer, if the bridge is designed by the bridge company the weight may vary as much as 10 per cent., according as it is paid for by the pound or in a lump sum. When the buyer does not have his engineer enforce a specification I would not attempt to say what the variation in weight might be, but will remark that the low bid would generally mean the light bridge. Buying a bridge in this way is like buying a pig in a poke, the buyer certainly does not know what he is getting for his money. Under the above system of purchase the contracting companies themselves will admit that the buyers must trust them to give full weight, but they will argue that a company which has built many bridges in different parts of the country has a reputation to live up to which is a guarantee of good work. A very little reflection will show that this is not the case. Let us say you buy a bridge which fails in fifteen years, but which was supposed to last for fifty years. In fifteen years conditions will have changed; the bridge company will perhaps be under different management, the old councillors who bought the bridge will have been replaced. Fifteen years is too long a time for a bridge company to look ahead with much fear of having to stand the consequences of broken promises, especially when it is doing just the same as its competitors in the same line.

The obvious way to prevent this unsatisfactory state of affairs is for the purchaser to pay for the engineering labor on a bridge directly to his own man rather than indirectly in the price of the bridge to an official in the pay of the contracting company.

This little digression has been provoked by the subject of costs, and is intended to show how unreliable are cost data relative to steel bridges unless you have the weights. The weight of a steel bridge is one of the most characteristic things about it to the bridge engineer, and also, of course, to the contracting bridge company; but the optimistic buyer could seldom tell you what he is paying per pound for his steel within a considerable percentage.

The relative cost of steel and concrete bridges depends upon more things than there is time to mention, but I shall venture this general statement. The shorter the span the more likely is it that concrete will be cheaper than steel, and the longer the span, the more probable that steel will be cheaper, at least in first cost.

Choice of Type of Concrete Bridge

Where the roadway lies only a short distance above the water, arches are not suitable except for very short spans. For such situations concrete "flat tops," that is beam or girder bridges, are preferable. They are economical for spans up to 40 feet, and, under some circumstances, for spans of 50 feet. For greater spans than this, where there is not sufficient height for an arch, steel or wood has been until quite lately the only available materials. However, quite recently concrete truss bridges have been proved successful up to spans of 200 feet, and are suitable for any situation where steel trusses can be used unless the heavier and more rigid centering required would make the cost prohibitive. Where a bridge must be built on a grade, in which case teams cannot be prevented from constantly trotting over it, even with heavy loads, there is an additional argument for concrete. Here the constant vibration soon wracks the joints of a steel bridge, but is almost non-existent in the concrete. However, where an arch is built on a grade extra care is required in the design, otherwise the extra weight of earth on one side of it would be unprovided for, and you know without my mentioning it that a load on one side of an arch has a worse effect on it than if another equal load were placed on the other side to balance it. Another kind of arch which requires extra care in designing is the skew arch. If time permitted I should tell you of the failure of a large skew arch in Australia and of the report of a commission of experts upon it. As it is, I shall content myself with saying that if any of you are thinking of building an arch on a skew, ask your designer to tell you of the report just referred to. If he can't give you an account of it, don't let him build your skew arch. Indeed, I might have covered the ground just as well and more quickly by saying that great care must be exercised in the design of all arches. One of the decided disadvantages of the concrete arch is the fact that the simplicity of its lines leads some people into thinking that the design is such a simple matter that it may be properly and safely designed by one who would not attempt the designing of a steel bridge. No greater mistake could be made. Reuterdahl says in his work on arches: "Of all the problems of bridge design, the analysis of the arch is by far the most difficult."

Notable Examples of Concrete Arches

To show the limits so far attained, I shall refer to one or two particular examples. The largest concrete bridge in existence is the Grafton bridge in New Zealand, with a span of 320 feet clear. Second to this is the Rocky River bridge, Cleveland, span, 280 feet. This holds the record for America. The third in length is the Sitter, in Switzerland, span, 259 feet. Next to this, and the second longest in America, is the Walnut Lane bridge in Philadelphia, with a clear span of 233 feet. Altogether there are ten concrete arches with spans of over 185 feet. Besides those mentioned, an arch is now building in Spokane, Wash., which will have a span of 281 feet, and another, the Lorrimer avenue bridge, Pittsburg, 300 feet in span. An arch is projected, the Henry Hudson Memorial Arch, to cross the Spuyten Duyvil creek, New York, with a clear span of 703 feet. If this is ever built it will have more than double the span of any masonry arch now in existence. This is perhaps close to the possible limit for concrete.

The builders of these concrete bridges must have felt that they were building for posterity. They have produced bridges which are permanent improvements, which require neither painting nor repairs, which grow stronger with age, as if to meet the conditions imposed by increasing traffic, which are flood proof and frost proof, rust proof and fire proof. The massive character of the structure surely symbolizes the strength and durability of concrete, and this is not more marked than their singularly graceful lines.

On account of the greater unit strength of steel, much longer steel spans are in existence than will probably ever be possible with reinforced concrete. To show what is possible with steel, I have made a little calculation which you may perhaps find amusing. A steel cable of the best quality was manufactured, hanging with a dip of one-fifth of its span, will support its own weight with a factor of safety of three for a clear span of over five miles, and it will support four times its own weight in dead and live loads for a span of 7,000 feet. It is literally true that here steel has concrete "beat a mile."

The greatest bridge engineers, especially in this country, as yet have been designers in steel, but the time is not far distant when designers in concrete will produce structures as remarkable in every way as the masterpieces in steel.

Consideration of Steel Highway Bridges

Changes in Practice During Recent Years—The Wide Sphere of the Steel Arch—Advantages of Securing Expert Advice*

By A. W. Connor, C. E., of Bowman & Connor, Municipal and Structural Engineers, Toronto

The building of permanent and substantial bridges is very closely associated with the building of good roads. As the cost of bridges form a large part of the expenditure in highway improvement, it behoves those who are entrusted with this work to see that the best value is obtained for the money. Though it may appear a very simple matter to get the best value by the usual system of calling for tenders, it is really not so. Large amounts are wasted every year by neglecting simple precautions. This association is much interested in such knowledge of highway construction that will enable them to get the best and most enduring value for the outlay.

Practical and Explanatory Observations

It is not proposed to deal with the question of steel bridges in a technical way, but to give some practical observations that may be of interest to those having bridges under their control.

The early bridges in this province were built of wood, or wood and iron. They are now being replaced by more permanent structures in steel or concrete. The steel bridge is a very modern structure, both as regards its material and its design. The advance is due to greatly improved methods of manufacturing, by which a very uniform and reliable grade of structural steel is obtained. In the early 90's, steel, though at first looked upon with suspicion, began to replace iron in bridge work. In 1895, when the writer began bridge work, Carnegie's Handbook referred to iron and steel sections, but now no iron sections are rolled. The steel bridge has also been improved by a scientific study of design and working conditions, also in methods of manufacture and erection. It is not so long ago that bridges were built by guesswork, tempered with a certain amount of good judgment. Now bridge designing is a specialized branch of engineering. The up-to-date steel bridge is always built with a solid and permanent floor, and is a heavier and more rigid structure.

The writer has seen many changes in bridge practice during the last 15 years. Being the history of many bridges, it may be of interest to recall the advances made. Formerly, even moderately short spans were all pin connected structures; now all but very long bridges are rivetted. Then, wooden floors on wooden joists were largely used, now, concrete floors on steel stringers are nearly always employed. The solid floor has the advantage of permanency, larger carrying capacity, does away with vibration (such as from trotting horses), and distributes any sudden or heavy load over a greater part of the truss. The rivetted bridge is more stable than the pin connected structure, there being no loose joints or adjustable members to work loose and throw undue strains on other members. The loose joints cannot be protected from the weather as well as the rivetted; so that the latter is the more durable also. The pine connected bridge is lighter and cheaper to erect than the rivetted, but [illegible] differences in the length of members or to ambiguity from differences in the length of members or to ambgiuity from double systems of web members. The rivetted bridge consists of fewer but heavier members than the pin connected structure and is consequently more permanent and less seriously damaged by accident to one member.

Another improvement has been the substitution of rivetted stiff lateral and sway bracing systems for the loose adjustable rods previously employed. With a solid floor, however, the effect of the wind is less important in the bottom lateral system of through bridges. "Necessity is the mother of invention" is true here also, for the traffic over bridges is now much heavier than formerly. The traffic over highway bridges is likely to increase in the same way as that over railway bridges, so that there may be further advances necessary in the future.

The sphere of the steel bridge is a wide one. It is the most adaptable to all needs for first class and permanent work. It has practically driven the wood and iron structures from the market. The reinforced concrete bridge is its principal rival. For short spans the latter is often the cheaper, but for spans over 100 feet the steel bridge will generally be the cheaper. Though some long span concrete arches have been built, they are only possible under favorable conditions of the site. In such locations a steel arch might be as cheap, and also as aesthetic.

The life of the steel bridge may not be as long as the concrete structure, but, if built substantially, it may compare very favorably with the reinforced concrete structure, especially if the amount of reinforcing steel is not liberal.

Advantages of Consulting a Bridge Specialist

Every steel bridge built now is by no means as perfect as it might be. Generally, a purchaser gets a good article when he knows what value to expect and insists on getting it. Municipalities, from not knowing the values of bridges, often specify and get a poor article. Generally they take the cheapest bridge offered, regardless of its value in strength or durability. The best way to get good value is to employ a bridge specialist to draw up plans and specifications and see that every detail of the work is carried out in accordance therewith. It is a mistake for even an engineer who is not a specialist in bridge work to ask each bridge company to send in his own design, based on any of the standard specifications. There is no good highway bridge specification, as they are all out of date, being based on light wooden floors. The dead load unit stresses are too high for heavy floors, where the dead forms a large part of the total load. The defects likely to occur in a bridge thus let on competitive designs are:

1. The structure is apt to be too light to be able to resist rust very long. Every contractor has to cut down the weight to be the lowest bidder. The thinner member is also apt to be brittle, through cooling in the rolls.

2. The price is so low that every detail has to be cut down to the finest point; end struts are left out, and pointing and other work carelessly done.

3. There being no inspection, inferior metal might be used.

If a competent engineer is employed he will call for a reasonable specification and see that it is carried out. This is a protection to the municipality and to the honest and well equipped contractor. Having decided to go to the expense of a good steel structure, it is a mistake to try and save a few dollars in cutting down the weight at the loss of hundreds in the life of the structure. There is no extra cost in the additional material required for durability, so the cost is a very small percentage of the total cost of the bridge, with abutments. If the contractors do not have to go to the expense of preparing designs some of them will bid on the work and the extra competition will easily save the engineering fees.

The engineer will also check over all the detail drawings of the work and see that every joint is of full strength. Even the honest contractor might make a mistake at one joint, which would impair the strength of the whole structure. The Quebec bridge disaster furnishes a very striking illustration of this. The immediate cause of the fall was the weakness of the lacing of the bottom chords. Dr. Galbraith has stated that if a man were to have struck one of those bars with a hammer he might have brought down the whole of that great, massive structure.

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*Read at the Annual Convention of the Good Roads Association.

The engineer will examine the work during manufacture and erection and see that every detail of material and workmanship is first class and in accordance with the plans and specifications.

The most important thing in the life of a steel bridge is to see that it is kept carefully painted. If not, rust will soon reduce its strength. The surface must be clean and dry before painting. Rust will spread even under paint. All bridges should be repainted every few years.

Government Standard for County Roads

Main Requirements of the Highway Regulations—Modern Road Machinery Essential—The Most Suitable Type of Road—Bridges and Culverts*

By W. A. McLean, Provincial Highways Engineer for Ontario

The Government Standard for County Roads is a subject which would tempt a very long address on road-building, but more especially it calls for an explanation of what is termed by the Highway Act, "The Regulations Respecting Highways." In order that the chief points may not be lost sight of in unnecessary detail, I desire to briefly outline the principal requirements of these regulations.

Management

First importance is attached to the systems of management. On this, the success of any county system depends. The regulations require that the management be centralized in a county road superintendent. The requirement is merely that the organization of a joint stock company be followed—viewing the property owners of the county as stockholders; the council as a board of directors; and the road superintendent, a manager carefully selected by the council because of his qualification for the position. If he is a capable man, his services through experience will grow more valuable to the county. Permanency of this kind is doubly necessary owing to the annual change in councils. The Department of Public Works cannot keep in touch with the individual members of an annually rotating council, but can assist in getting the best and most economical results through one permanent manager.

Regulations are Flexible

The regulations under which the road superintendent works signed the Toronto filtration plant, was in the city recently and inspected the plant. Mr. Hazen states that do not define one fixed standard of road to which all roads must be sandpapered. One fixed type of road is not applicable to the entire province if the best balance of economy and efficiency is to be secured. Differences of soil, road material, traffic, condition of road before improvement, drainage requirements, and other local circumstances are to be considered by your superintendent. The regulations, for the main part, state general principles; but at the same time, there is a type considered most suitable for the average main road.

Most Suitable Type

This consists of an earth turnpike 24 feet shoulder to shoulder of ditches. The camber or crown averages one inch to the foot from side to centre—12 inches in a 24-foot road. The centre is metalled with broken stone or first class gravel from 8 to 14 feet wide, and 8 inches in thickness after thorough consolidation by rolling. The road should have easy flowing grades with low spots filled and high places cut down. The open drains should have sufficient capacity and fall for storm flow; and tile underdrains should be laid as conditions require. Good drainage and grading are essential.

Old Roads

Old stone and gravel roads are to be improved by grading away the soft earth and sod shoulders; then restoring the crown by adding a covering of new stone or gravel. Grade and drain these roads if you wish, without gravelling, but never resurface with stone or gravel without grading.

Machinery

Modern road building machinery is required and of these one of the most valuable is the steam roller. To build roads in stretches of a mile or more, leaving the gravel or stone loose and without rooling, creates a serious obstruction to traffic. In some cases the speaker has seen such gravel and stone roads loose two years after building, as traffic had merely touched the edge—had not got up on the new metal When a roller is used, less stone is wasted; coarser stone can be used, making a stronger road and decreasing the cost of crushing; the rolled road is stronger, so that the cost of future repair is less; while a rolled road, instead of an obstruction to traffic, is in perfect condition for the heaviest loads or for light driving. One or more graders are, of course, necessary, and the use of all labor saving equipment and methods is urged. A stone crushing outfit is required where a suitable local supply of field or quarry stone is available.

Bridges

Bridges and culverts are to be of a permanent type. Steel trusses on concrete substructure; or reinforced concrete throughout are the materials favored.

Patchwork is Not Accepted

Road building is to be done in stretches of reasonable length. That is, patchwork of the statute labor kind is not accepted. While the regulations are flexible it is for the purpose of obtaining better, not inferior results.

Objects of the Act

The objects of the Act are three-fold:—

(1) To establish a businesslike system of management.

(2) To build up a system of main roads.

(3) To create an object lesson in management and construction.

Only one who has gone over the work, as has the speaker, can realize the great amount of success being achieved. As county after county completes and unites its work there will grow up in Ontario a system of main roads fully equal to requirements. Every county has to meet its own pioneer experiences and mistakes, but in spite of these splendid results are being produced in those counties that are operating under the Highway Improvement Act.

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*Read at the Annual Convention of the Ontario Good Roads Association.

Details and Cost Data on Road Building

Plant Required, Labor Entailed and Expense Attached to Various Classes of Work — Examples from the Experience of the Writer*

By C. R. Wheelock, Orangeville, Ont., County Engineer of Peel.

The cost of roads varies widely in different localities, owing to the difference in the conditions under which they are constructed, such as nature of the soil along the proposed road, the general grade of road—lever, ralling or hilly—the condition of the road in respect to drainage, the cost of labor per day, the kinds of road building materials that are available and how far they are situated from the road, the amount of travel over the road, and, if bridges or culverts are to be built, the span, the nature of the foundations, the kind of bridges or culverts now in use and the condition of each.

The extent of the plant required for road making is governed by the requirements of each case. The outfit for a macadam road usually consists of scrapers, plows, road machine, steam roller and sprinkler. The average outfit of this description will cost about $3,800. Where stone is available for crushing, a crushing plant may be added, consisting of a crusher, elevator, revolving screen and bins, at a cost of about $1,300.

An expert road foreman and machinery engineer are necessary to get the best results and to keep the work running smoothly. Competent men are available for these positions at from $2.50 to $3 per day. In respect to inspection of bridge work, Mr. A. W. Campbell hit the nail on the head, in a recent address, reported in "Contract Record" of February 16th.

The cost of cement-concrete bridge work varies in proportion to the cost of the material for construction delivered at the work. For example, take two arches of similar design built in the county of Peel last year. In one case the crushed stone, sand and gravel cost $2 per cubic yard delivered at the work; the cement was teamed about ten miles, and the price paid for the concrete was $7.15 per cubic yard. In the other case, the crushed stone cost $1.50 per cubic yard, the sand and gravel 40 cents per cubic yard, the cement was teamed one-half mile, and the price paid for the concrete was $5.75 per cubic yard. The minimum price paid for concrete in arch bridges was $5 and the maximum $8 per cubic yard. The minimum paid for concrete in abutments was $5 and the maximum $5.75 per cubic yard. The price paid for concrete covered excavating and refilling. The price paid for reinforced concrete bridge floors was from [illegible] cents to [illegible] cents per square foot. The steel for reinforcing in arches and flat top concrete bridges cost about 2¼ cents per pound.

The railing used on most of our concrete structures last year was two lines of 2-inch gas pipe with globe fittings, which makes a strong railing with a good substantial appearance at a reasonable cost. The cost of the railing painted and complete was 64 cents per foot.

The wages paid on the work were as follows:

Ordinary laborers	$1.50 to	$1.75 per day
Road foremen	2.00 to	2.50 per day
Machinery engineers		2.50 per day
Teams	3.50 to	4.00 per day

The cost of operating road machines was from $13.50 to $14.50 per day. In some cases traction engines were used on these machines instead of horses, with good results. The cost of operating was less, and it is estimated that on a clay road and in hot, dry weather, nearly twice as much work can be done.

The cost of operating steam rollers was from $3.90 to $4.25 per day; to this may be added the cost of sprinkling, $4 per day, making the total for rolling and sprinkling about $8 per day.

For the roads in the south part of the county, crushed stone was brought in by rail, as satisfactory local material was not available. This added very much to the cost of these roads. In some cases the freight was double the price of the stone f.o.b. at the quarry.

The following data gives in tabulated form the details relating to the dimensions, cost, etc., of several roads built on the County of Peel Road System in 1908 and 1909:

	Grading			Road Metal					
Location	Width of Grade	Cost per Mile	Class of Metal	Width of Metal Feet	Depth of Metal Inches	Freight on Metal	Length of Haul for Teams Miles	Cost per Mile	Total Cost per Mile
Ching'sy	28 ft.	$126	Crushed stone	9	7	$1034	1 3-4	$3145	$3271.00
Caledon	24 ft.	195	Pit Gravel	7	9	Local	1	685	880.00
Toronto Tp.	24 ft.	175	Crushed stone	9	8	1005	3 1-2	3557	3730.00
Toronto Tp.	27 ft.	145	Crushed stone and pit gravel	[illegible]	4 to 6	857	Stone ½ gravel 2	2170	2315.00
Ching'sy	27 ft.	200	Crushed stone	8	6	876	1 1-4	2808	3008.00
Caledon	24 ft.	272	Pit gravel	[illegible]	8	Local	1	528	800.00
Toronto Tp.	22 ft.	190	Crushed stone	[illegible]	8	[illegible]	2 1-4	3214	3404.00
Ching'sy	24 ft.	200	Crushed stone and screened gravel	8	[illegible]	Local	2 1-2	1750	1950.00
Toronto Tp.			Gravel	8	9	Local		650	1115.00
	26 ft.	85	Clay	[illegible]	[illegible]			180	

Road No. 1. Well graded, knolls cut down and hollows raised. Metal consolidated with a steam roller. As no local material was available, crushed stone was brought in by rail. The freight on about one-half the stone was 65 cents per ton and on the remainder, which was delivered at another station, $1 per ton. The price of the crushed stone f.o.b. at the quarry was [illegible] cents per ton.

Road No. 2. Well graded. The gravel was evenly spread on the road early in the summer, without being rolled, and in the fall when the gravel was partly consolidated by the travel over it, it was gone over a second time, the ruts filled and the road [illegible].

Road No. 3. Similar to No. 1, with the exception that the stone was all shipped to the same station, the freight being 65 cents per ton.

Road No. 4. This was an old stone road, wide and flat on up, the grading consisted mainly of cutting off the shoulders, although in some places it had to be regraded and ditched. Crushed stone was placed in the centre of the road 9 feet wide, and along each side of this a strip of gravel about 3 feet in width, forming a boxing for the stone and making the total width of the metal about 15 feet. The metal was well consolidated with a steam roller.

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*Abstract from paper read at the annual convention of the Ontario Good Roads Association.

Road No. 5—Similar to No. 1, except that the stone was all shipped to the same station and that the freight was 60 cents per ton and the stone f.o.b. at the quarry 65 cents.

Road No. 6—Similar to No. 2.

Road No. 7—Similar to No. 3.

Road No. 8—Well graded, knolls cut down and hollows raised. The metal was well consolidated with a steam roller. The metal used was a coarse gravel mixed with stones, which was run through the crusher and revolving screen.

Road No. 9—This was a short piece of road built as an experiment. The soil was a very light sand.

Directions for Earthwork on Railroads

Interesting Notes on Specifications for same, which should cover every Detail of the Work—Questions of Classifications and Overhaul

At a meeting of the American Society of Engineering Contractors on Jan. 10th, 1910, Mr. Jas. H. Bason, of the Grand Trunk Pacific Railway, gave an interesting paper in connection with which he prepared the following notes on specifications for earthwork in railway construction which contain interesting observations on the questions of classification and overhaul.

Specifications in General—The two main objects of any specification are these: (1) To define the work to be done so that any competent contractor may submit an intelligent bid. (2) To establish a guide and a standard by which the contract may be interpreted with fairness to each party.

To attain the first of these desired results, if the proposed railway line is of any considerable length or is located through a country with varying physical characteristics, the company should (1) compile complete right of way maps, profiles, estimates of quantities showing as fully as possible the character of the work. (2) Divide the proposed line into sections and ask for separate bids and make separate contracts for each section. Each section should be homogeneous so that the actual cost of performing any given class of work shall be practically constant throughout the section. The item of the transportation of supplies is included. (3) Lay great stress on the necessity of each bidder making a personal inspection of the work.

To attain the second result three cardinal principles should be observed in preparing the specifications:

(1) The schedule of prices should include every item that can possibly be foreseen with a view of reducing "force account" work and "extra items" to a minimum and of preventing either party from claiming or denying without justification that any piece of work is covered by the specification.

(2) Every item in the schedule of prices should be adequately covered by a corresponding clause or section in the specifications.

(3) The specifications should be so worded as to reduce to a minimum the possibility of difference of opinion as to which clause of the specifications any given item in the schedule of prices refers.

With these principles in view, the expression "in the opinion of the engineer" or its equivalent should be excluded as fas as possible. The price to be paid should be connected with the work done by language as concise and clear as possible. The contractor should have no excuse for insuring himself against loss by bidding higher prices than the actual work justifies.

Clearing and Grubbing—The usual specifications for clearing seem to be sufficient, but exception may be taken to a common clause which provides that no grubbing will be allowed on the slopes of any cutting where depth of cutting exceeds a certain number of feet. The latter clause arose from the former practice of carrying a deep cut through to grade as the work progressed. This obviated the necessity of grubbing such cuts, as the stumps fell into the cut by gravity. With modern grading machines this practice has changed, and the contractor finds it necessary to grub out the stumps as the work progresses. The result is, if the limit above mentioned be four feet, that:

(1) The contractor is paid for grubbing where the cutting is 4 feet or less, but is obliged to do exactly the same work at the same cost without pay where the cut is over 4 feet.

(2) The difference between 4 feet and the next greater depth being infinitesimal, disputes arise as to payments.

(3) A change in grade or alignment may require a contractor at no measurable difference in cost to do unexpected grubbing without compensation or may give him compensation where the company did not expect to pay. All grubbing should be paid for.

Classification of Excavated Material—Following up the general principles enunciated above and especially that which requires that "difference of opinion" shall be eliminated, it is clear to the writer that there should be only three classes of excavated material, not including excavation under water, or excavation or removal of any artificial work such as old masonry, etc. These three classes should be: (1) Solid rock. (2) Loose rock. (3) Common excavation.

Common Excavation—In many specifications the dividing line between common excavation and loose rock is determined by the "plow test"; this test should be discarded entirely as unsatisfactory. There are thousands of acres, which may in the future be crossed by railways, where the material to be moved has not the faintest resemblance to rock and where no sane man would attempt to break ground with a plow. The plow test is impossible, and the logical result, if the specifications provide this test, is that such material must be classed as loose rock.

Many of the western roads have discarded this test and specify that "all material not classed as loose or solid rock shall be common excavation." The companies using this specification specify that loose rock shall be any rock that can be removed without blasting, although blasting may occasionally be resorted to, or any rock in detached masses varying in size between given limits, and that solid rock shall be rock in masses that cannot be removed without blasting. It will be noticed that these specifications require a definition of the word "rock."

The writer submits the following specifications for the classification of excavated material:

In these specifications the word "rock" shall be interpreted to mean any portion of the consolidated material forming the crust of the earth which has a greater volume than 1 cubic foot. Unconsolidated materials, such as sand, gravel, clay, hard pan, are not rock under these specifications.

Solid Rock—All rock in masses that cannot be removed without drilling and blasting. All boulders or detached pieces of rock that measure 1 cubic yard or more in volume.

Loose Rock—All rock which is loose or soft enough to be removed without blasting, although blasting may, at the option of the contractor, be occasionally resorted to. Detached pieces of rock measuring in volume from 1 cubic foot to 1 cubic yard.

Common Excavation—All material not solid or loose rock.

The sizes specified for boulders and detached pieces are ,of course, subject to be changed according to varying circumstances. No tests are recommended, as the writer believes that they would serve no useful purpose and tend to cause complications.

Excavation Under Water—This classification should be applied to all channels and pits under water which cannot be drained by ditching. The price or prices paid should be per cubic yard and should cover all material and labor, including coffer dams, necessary to do the excavation required. There should be described. The price should equal the cost of the dams. In many cases special specifications would be necessary.

Overhaul—Overhaul should be paid for, a price fixed by the company, per cubic yard per hundred feet beyond the free haul, and the method by which overhaul is to be calculated should be described. The price shoul dequal the cost of the work and is therefore a variable quantity. The limit of free haul is also variable. Both price and free haul limit should be accurately fixed for each section.

Sub-Contracts—Sub-contracts should be recognized and proper provisions made for their protection. In the face of the universal practice of letting sub-contracts it is absurd to forbid them even with the usual proviso that they may be made with the written consent of the chief engineer.

A Slide Rule for Reinforced Concrete Slabs

The latest addition to that steadily increasing family of calculating devices is a slide rule for reinforced concrete slabs. This new instrument has been invented by Arthur W. French, professor of civil engineering at the Worcester Polytechnic Institute, Worcester, Mass. In appearance the rule differs very much from the ordinary type, as it is slightly shorter and considerably wider, the exact dimensions being 4¼ x 9 inches. The principle is the same, however, although there are two sliding and three stationary scales instead of two of each, as found in the regular rule.

The top or A scale, as it may be called, represents the span in feet. The upper sliding, or B scale, is graduated in the total load per square foot, and the middle stationary scale, C, gives the bending moment in inch-pounds. The lower sliding scale, D, furnishes the depth of the slab, and the bottom scale shows the cross section of the steel required. Below this area value are lines giving the sizes and spacing of square and round reinforcing bars, and the thicknesses of expanded metal and with cloth, providing the same amount of reinforcement.

The method of using the rule is as follows. Under the span, as given on the A scale, set the proper factor on the upper edge of B for simple or continuous spans.

The total load per square foot, as marked on the lower edge of this scale, is directly over the bending moment on the C scale. An arrow on the upper edge of D is set under the bending moment value just obtained and under the lines of this scale, denoting the depth of slab, the cross section of the required reinforcement is given in square inches. Carrying this value down into the tables previously mentioned gives the amount of the different reinforcing materials required to produce the given cross-sectional area

It is stated that only formulæ recognized as best by leading engineers and the technical societies are used in designing the rule, and that the results obtained are both conservative and accurate. The rule is simple to operate and is durable. The slides and lining are of mahogany and the face is of heavy paper, which is coated over the printed lines and figures.

Canadian City Engineers

Mr. William Murdock, St. John, N.B.

Mr. William Murdoch, City Engineer of St. John, N.B., was born at Paisley, Scotland, on April 16, 1848. Six years later he was brought by his parents to St. John, and has remained there ever since. Mr. Murdoch was educated at the Grammar School at St. John and afterwards, while serving an apprenticeship in a foundry, studied his profession with Mr. Robert C. Minnette, ex-City Surveyor. On the completion of the apprenticeship, and at the age of 20 years, he obtained a position in the office of the Sewerage and Water Commission. In 1869, Mr. Murdoch was appointed Assistant Engineer. He retained this post until 1894, when, on the death of the superintendent, he was appointed to the higher position. In the year 1906, he was made executive head of the department, with the title of Director and Superintendent. Mr. Murdoch's appointment to the position of City Engineer last year put him in charge of a responsible and somewhat onerous position.

Mr. Wm. Murdoch, City Engineer of St. John, N. B.

St. John has developed rapidly during the past few years and the duties of the city engineer are by no means a sinecure. They include the care of all the public works of the city, namely, ferries, harbor, streets, water and sewerage, sewage disposal, and also the many details that are inalienable from municipal service. Nevertheless, the general conditions under which Mr. Murdoch labors are most favorable. He is well connected and highly esteemed in his sphere, and having grown up in the city and with the city, is able to plan for its needs [illegible] to the [illegible]

The Canadian Society of Civil Engineers [illegible] the [illegible] to Professor [illegible] of McGill University, Montreal

Reinforced Concrete in Factory Building

Weight - Supporting Ability and other Advantages of this type of Construction Comparisons of Cost Favor Concrete Structures

The value of reinforced concrete for use in the construction of factory buildings and other structures where heavy loads are to be carried by the various floors is most instructively considered in a paper by J. P. H Perry, of the Turner Construction Company, and presented at a recent meeting in New York City. The author points out that the most frequent question asked is whether or not concrete is an experiment. In discussing this and other points he says:

Reinforced concrete is now an established structural material of recognized merit. It is not necessary to base this statement merely on the existence of some 4,000 or 5,000 reinforced concrete buildings of ages varying from 12 years down to a few weeks, for a study of the material itself is an assurance of the permanency of the structure in which it is used.

Concrete has been known from the earliest ages. In many parts of southern Europe concrete foundations, viaducts, bridges, etc., can be found, many of them 2,000 years old. Reinforced concrete is simply an improvement over this ancient concrete, because of the better quality of cement used to bind the aggregates together, and the addition of steel reinforcement. A beam in a building is subject to tension at the bottom and compression at the top. Concrete possesses great strength in compression, while in tension it is weak, but by placing bars or wire at the underside of a simple beam it becomes an economical structural member. The reinforcement takes the tensile stresses and the concrete the compression. It is possible to make the combination, because concrete and steel expand and contract in almost identically the same ratio. This combination was first made by Monier, a French flower-pot maker, in about 1860, but the commercial use of reinforced concrete does not date much back of 1897 or 1898 in this country.

The Average Reinforced Concrete Building

The average reinforced concrete building is constructed similarly as a structural steel building—a skeleton or cage construction of the columns and floors is run up first, and as soon as the forms or centering have been removed from any one storey, the building of the walls, stairs, partitions, etc., begins, and then follows the progress of the framework of the building as fast as possible. In this way an economical distrbiution of labor and material and very rapid construction are possible.

Backed by skill and experience a reinforced concrete building can be completed in about the same or less time than a structural steel building. While a reinforced concrete skelton for a building cannot be erected as fast as one of steel, it can be begun and partly erected before the necessary structural steel can be detailed, rolled, fabricated and shipped from the mills, and the building finished ready for occupancy before the steel structure can catch up with it. Under present market conditions it takes from six to nine weeks to obtain steel from the mills. The necessary smill size bars for reinforcing concrete can always be obtained out of stock on 24 hours' notice. An amount of cement, sand, stone and lumber sufficient to get a job started can nearly always be obtained locally. With reinforced concrete construction it is not necessary to wait before concreting the footing, and the first storey columns, to have complete detail drawings of the building, such as is the case in structural steel work.

The Rogers & Pyatt factory at Manhattan, N.Y., is a 10-storey and basement building, roughly 60 x 70 feet in plan, of reinforced concrete throughout. After the completion of the foundations, from the day that the first concrete was put in the basement columns to the completion of the roof, but 47 working days elapsed, and the building was turned over to the owners for occupancy in three and one-half months. The Isaac Mason warehouse at Brooklyn, N.Y., is a seven-storey and basement reinforced concrete building, 40 x 80 feet in plan. It took but 48 working days to put the roof on this building after the excavation was finished, and but a few days over three months before the owner moved into the building. The Bush model factory, at South Brooklyn, N.Y., is 600 feet long, 75 feet wide, six storeys and basement in height, of reinforced concrete throughout. The roof was put on this building in 63 working days after the piles were driven.

These three records should demonstrate clearly that reinforced concrete construction does not mean slow construction.

In the case of extension No. 3 of the Bullock Electric Company, at Norwood, Ohio, reinforced concrete was adopted because of the great reduction in the time necessary to complete as compared with steel construction. This building is two storeys high, 256 x 150 feet, and was ready for the steel roof trusses in nine weeks after the contract was signed.

Weight-Supporting Ability

Reinforced concrete buildings are noted for their strength and for their ability to safely carry unexpected loads. Floors have been designed to carry as high as 5,000 pounds per square foot, and have been doing their work satisfactorily for seven years. In several buildings which have been constructed by the company with which the speaker is connected floors have been designed to carry 600 pounds superficial load per square foot, and have been subjected to 1,500 and 2,000 pounds live loads without the slightest indication of injury or increased deflection. Perhaps as remarkable an instance of the strength of reinforced concrete floors under severe load is furnished by an embossing press on the seventh floor of the Robert Gair Company's factory in Brooklyn, N.Y. The floors in this building are designed for live loads of 250 pounds per square foot. The press in question weighs 16 tons and rests on a base 3 x 6 feet; the load is therefore nearly one ton per square foot. There is no deflection noticeable under this press, and there have been no precautions taken to distribute the load.

Joseph Bancroft & Sons, Wilmington, Del., who have a reinforced concrete dyeing establishment with flooors 6-inch thick, spanning between the beams 10½ feet state in a letter. "This floor was unintentionally subjected to an impact test by a piece of granite falling 32 feet and striking on one corner, making a concentrated blow over an area of 6 x 4 inches. The piece of granite was 6½ feet long, 18 inches wide, and 8 inches thick, and weighed 173 pounds per cubic foot. The floor is still in use and this accident occurred four years ago All of our floors are subject to heavy loads and heavy shocks, and wherever this material has been employed, it has given satisfaction."

Little Vibration

In a building where many machines are installed the matter of vibration is important. The majority of owners of concrete plants are well satisfied that they get less vibration with this kind of construction than with any other. The Robert Gair Company's large plant in Brooklyn consists of two 6-storey brick and first-class mill construction buildings, and one 6-storey and basement reinforced concrete factory. All three structures are filled with the heaviest presses, cutters, embossers, etc. The vibration in the mill construction buildings is such that a plumb-bob hung parallel to any one of the wallls will sway to a considerable extent; in fact, the buildings show that it would be difficult to produce more severe vibration than they are subject to. The reinforced concrete structure directly across the street, subject to the same conditions of foundations, loads, vibration, etc., is remarkable for its rigidity. This building measures 231 x 200½ feet, and is nine storeys and basement, having 10 acres of floor space. On a typical floor are a number of very large presses; one room on the seventh floor, 231 feet long, is filled with presses which operate rapidly and have very heavy reciprocating parts, yet a coin will stand on edge anywhere on their base frames. All through this factory one may lay his hand against a column and feel scarcely a tremor.

The Ketterlinus Building, at Fourth and Arch streets, Philadelphia, Pa., is a lithographing factory 80 x 67 feet, eight storeys and basement, of reinforced concrete throughout, excepting a facing of brick with terra cotta trimming, which adjoins an older part of the plant. The old building is of steel construction fireproofed with terra cotta. In both buildings heavy machinery is running and large printing presses are at work on the third, fourth and fifth floors. A comparison of the serviceability of the two types of construction shows the advantages of reinforced concrete.

In the building of steel and terra cotta, the vibration from the machinery is noticeable as soon as one enters, while in the new wing, the concrete, because of its greater mass and inertia, absorbs the vibrations. The machinery is such that it is difficult to appreciate its vibratory tendency. As a result of the reduction in vibration in the reinforced concrete building, the noise of the machinery is greatly lessened. This is in a building of comparatively small size, but considerable height—a type more susceptible to vibration than a larger structure would be.

The Floor Question

If concrete floors in factory buildings are objected to as being either hard on the operatives or producing dust, which would seriously interfere with the manufacturing process, wooden floors can be laid on top of the concrete. This increases the cost, but not seriously. The prejudice against concrete floors is largely dying out among employees in the average plant. For perhaps ten days a mill hand will find that his feet hurt if he is working on concrete, but after that he gets used to it and learns to wear thicker-soled shoes, and his complaints are likely to be few, because he realizes that the floors are there to stay, whereas he is necessarily not permanent. The great advantage of a concrete [illegible] a wooden one is that it can be easily washed and is of itself more sanitary.

Concrete walls do not need waterproofing. Because of the dampness in many concrete block bungalows the impression is that reinforced concrete buildings having walls of the same material are damp. This is quite the opposite of the facts. The company with which the speaker is connected has erected over 280 reinforced concrete structures, representing over 100 acres of floor space, and in none of these buildings is there any trouble from dampness on the walls. In several buildings brick curtain walls were put on the front and rear and concrete walls on the sides. After heavy storms the 12-inch brick walls will show moisture, whereas the concrete walls have remained impervious. In this class of construction the concrete is placed quite wet and when set thoroughly the walls are very dense and homogeneous. During the process of drying out the walls will undoubtedly be damp, but as this rarely, if ever, takes over four months, the building is dry by the time the stairs, partitions, heating, lighting, plumbing, elevators and other detail fittings have been installed.

Other Advantages of Reinforced Concrete

Long spans can be constructed of reinforced beams or girders in an economical manner, when compared with structural steel beams and girders. Where light loads, such as are occasioned by roofs, have to be carried, long steel trusses will, in most cases, be better. For heavy loadings reinforced concrete has been used up to 50-foot spans in a great many instances, and there are several cases on record of concrete spans running up to 70 and 80 and to 112 feet. These are, of course, exceptional, and are merely cited to give an idea of the general adaptability of this type of construction for buildings where travelling cranes have to be used or where large assembling rooms are on the first floor, and the ceilings have to be designed to carry loads on the floor above.

One of the principal advantages offered by reinforced concrete construction of buildings is the amount of light obtainable. In the ordinary mill construction building not more than from 30 to 35 per cent. of the wall area can be used for windows. Reinforced concrete buildings generally have 50 per cent. of their walls in window area, and if necessary 80 per cent. of the walls may be windows. This is possible because of the skeleton method of construction. The light in the interior of a reinforced concrete building is increased by the white, clean interior always obtained. The concrete is left as it comes from the forms, and is given a coat of cold water paint. From the very nature of the material, the construction is sanitary. Vermin are impossible, as there are no places for them to hide. The floors and walls can be washed down at any time, as the construction is waterproof.

Fireproofing

If there is one feature of this construction which has successfully withstood criticism it is fireproofness. The insurance rates applying on reinforced concrete buildings are as low as on any type of construction. In fact, some of the mutual fire insurance companies offer to write the lowest rates on concrete industrial buildings; lower, indeed, than on any other type of construction.

Where large plants are built of brick [illegible] owner or architect may hesitate about using concrete construction, as it will contrast too sharply and be out of keeping with the other buildings. In such cases a skeleton of reinforced concrete can be erected and [illegible], curtain walls filled in or brick bearing walls used. This system has been used on a great number of buildings throughout the country and has been found very satisfactory.

Comparisons of Cost

In most instances the determining factor in the choice of structural material for a new building is the cost. Reinforced concrete will generally run from 5 to 10 per cent. higher in first cost than first-class mill construction and from 10 to 20 per cent. lower than [illegible] construction.

[illegible]. A large warehouse in Brooklyn was begun in May, 1908. At that time new construction work was scarce, and all contractors, both in the concrete and steel lines, figured very closely to secure the job. The successful reinforced concrete figure on this particular building was $30,000 lower than the best bid received on the same plans executed in fireproofed structural steel. A large factory in Philadelphia was designed in steel and estimates received on the original plans. The architects considered an alternative in reinforced concrete construction and saved the owner $60,000. A large publishing house and loft building was recently completed in Springfield, Mass., of reinforced concrete throughout, thereby saving $40,000 over the probable cost in steel. These three instances represent, respectively, savings of 12, 25 and 10 per cent. In competition with mill construction the percentage depends almost entirely on the size of the building. For structures costing $40,000 and less, and of the height of four storeys or less, the brick and wood construction will run about 15 per cent. less than concrete. On larger buildings, however, concrete gets closer to the cost of the mill construction. The designers of a very large hardware building in Minneapolis were surprised to find that the estimate on reinforced concrete construction was slightly under that for mill construction. A similar case occurred in Toledo, Ohio. Both of these propositions, however, exceeded $150,000 in value.

The initial cost should not be the only consideration. There are certain fixed charges which enter into the relative values of buildings. These may be briefly summarized as follows: Insurance, maintenance, depreciation, amount of light available, freedom from vibration, not destroy the building. It is difficult to put an exact elimination of vermin and the assurance that a fire cannot monetary value on these items. Each plant manager would have his own views on the subject and local conditions would alter materially any assumptions. If, however, due consideration be given to the saving which can be obtained on each of these items by using a reinforced concrete building, it will generally be found that, even though the concrete structure cost, complete, 10 per cent. more than mill construction, there will be a saving annually of from 1½ to 2 per cent.

Wisdom of Pleasing the Owner

If the plans are changed in any material way by the builder, there is a recourse, one that can be in a measure a preventive of any great differences, when the work has been gotten under way. Many builders of homes are sceptical about how a plan will work out until they see the same in actual erection or completion, and their ideas are often totally at variance with the plans they had first conceived. It would be well to make an effort to please the home builder, when such is within reason, and this can be done, provided there is some diplomacy used as the work progresses.

It sometimes happens that the plans are so complicated, to the builder of a structure, that the same will have a very great difference in the completed building, and as the work goes forward the owner should be permitted to make inspections at intervals, so that there will be less cause for differences when the contract has been completed. There is wisdom in sometimes making an effort to please even the crank, and in order to do this there should be taken into consideration in advance of any actual work at least a general conception of what the final outcome will be, so that there can be less opportunity for the builder to make unreasonable demands for changes that are not so specified in the contract.

New Provincial Railway Engineer for Alberta

Mr. R. W. Jones has been appointed Provincial Government Railway Engineer for Alberta. Mr. Jones will have the entire supervision of the branch lines now being built under government guarantee by the C.N.R., the G.T.P. and the main line of the Alberta & Great Waterways. He has recently had the superintendence of the construction on the main line of the G.T.P., from Winnipeg to Wolf Creek. The salary attached to his new position is about $3,500. For more than 12 years Mr. Jones was in the service of the Great Northern and took a prominent part in the building of the Transcontinental from Havre, in Montana, to Seattle. He was also in charge of the construction of the Cascade tunnel. During 1903 he superintended the double tracking of the C.P.R., from Winnipeg to Port Arthur.

Interesting to Cement Buyers

To many of our readers, especially to those whose sphere of work lies in Eastern Canada, and more particularly in Toronto, the gentleman whose portrait is published herewith will need no introduction. Mr. Rogers is handling the output of the independent cement concerns, and having in view the results that he has accomplished in other fields of endeavor, we venture to predict that his name will soon be a familiar expression wherever cement is considered an important factor of present day development work in Canada. The office of the Alfred Rogers' concern is located at 307 Stair Building, Toronto.

Mr. Alfred Rogers, of Toronto.

We regret to report the death of Mr. Matthew Sheard, an old-time architect of Toronto. The late Mr. Sheard was born in Toronto and practised his profession there for upwards of 35 years. Among other places, he also practised in Chicago, where he took part in the rebuilding after the great fire. The deceased gentleman was a brother of Dr. Sheard, medical health officer for Toronto.

We regret to report the death of Mr. Jas. Weller, vice-president of the firm of A. Weller & Company, builders and contractors, Toronto. His death was due to typhoid fever, after an illness of but three weeks' duration Mr. Weller was 32 years of age.

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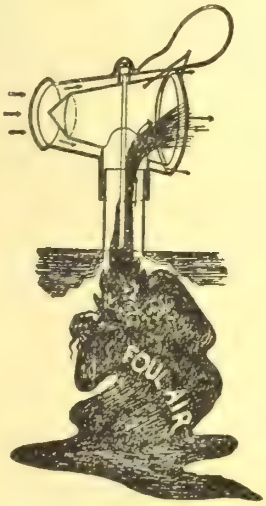

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Average Cost of Laying Water Mains.—The following table rearranged from the report of the Engineer Department of the District of Columbia for the last fiscal year, shows the average cost per lineal foot for laying water mains of various sizes (including repairs to improved pavements) during the year ending June 30th, 1909.

Size.	3 in.	4 in.	6 in.	8 in.	12 in.
Lineal feet laid	919	1,281	586	58,200	5,135
Cost of labor per lin. ft..	$0.377	$0.423	$0.485	$.0386	$0.600
Materials, per lineal ft..	.401	.588	.601	.910	1.480
Repairs to pavements per lineal ft.	.441	.328	.097	.037	.167
Total	$1.219	$1.339	$1.183	$1.333	$2.247

A Useful Book on a Useful Art

"How to write a business letter," is a matter upon which there are few people who would not be the better for a little advice. In a book with the above title, which has just been published by Gies & Company, of Buffalo, N.Y., the author, Chas. R. Wiers, of Buffalo, has set forth concisely and in an interesting manner, many of the salient points of letter writing. His ideas are those of the modern American business man, and are necessarily tinctured with American ideals, but the broad principles are those upon which successful business letter writing depend. They are set forth clearly and forcibly so that in the greater number of instances they admit of no contention. A strong point is made of the common habit of employing useless expressions, which have received the sanction of long use, but which mean nothing and are really only an encumbrance to letter writing and reading. This class of expression will be quickly recognized from a few examples, viz., "we would say," "we beg to say," "allow us to explain," etc. These forms have arisen probably from a desire to improve the form of a sentence, or to introduce a subject gradually, but they have become meaningless, with long usage, and if one examines them critically they are worse than meaningless, as they are not sincere. Considerable stress is laid upon the necessity for brevity, courtesy, clearness, correct spelling, sincerity, etc. An excellent feature of the book is a large number of examples of letters illustrating the ideas which are dwelt upon. The book itself is to be commended for following the suggestions it contains. It is brief, concise, clear and well arranged, so that it is sure to be of value to any business man.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

289. Glass—A Newfoundland firm would like to get into communication with manufacturers of glass for filling in washboards.

292. Cement—A manufacturers' agent in Barbados who is handling several Canadian lines, desires to have correspondence with manufacturers of cement in Canada.

324. Gates, railings, etc.—A firm of architectural metal workers in the English Midlands making gates, railings, electric light fittings, etc., wishes to enter into correspondence with prospective agents or buyers in Canada.

325. Street paving process—A correspondent in London wishes to bring to the notice of interested parties in Canada a new sanitary, dustless street paving process.

Recent Canadian Patents

The following is a list of recent Canadian patents relating to contractor's appliances and building trades, and furnished by Fetherstonhaugh & Company, 5 Elgin street, Ottawa (Russel S. Smart, resident):

123,689—Wm. Johnston, Wm. Hirons, Winnipeg, Man.; window sashes.

123,710—J. Cartwright, E. Wellington, B.C.; means for firing a blasting charge.

123,718—H. Conworth, Orillia, Ont.; cement brick machines.

HOISTING ENGINES

Some of the strongest friends of the M. & H. Hoists are to be found among the men who have owned and used them. For instance the following written by one of the Lumber Kings of Canada—a man who telegraphed us an unsolicited order for another Hoist not long ago.

"Answering your inquiry, I am pleased to state that the Hoists with which you supplied me some years ago have given good satisfaction and have been in pretty constant use ever since."

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always satisfy our customers and our standard of quality never varies.

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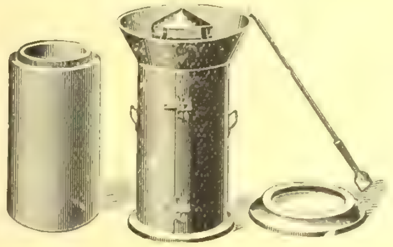
Robinson's

Patent Tile Moulds



For Making Concrete Culvert Pipe

The cut shows complete mould with cone top filler, also a culvert pipe just finished, showing the bottom ring. No one can deny the fact that cement culvert pipe properly made and laid will outwear all other constructed culverts whether made of wood or steel. Wood will rot, steel will rust, but cement will neithor rot nor rust, but improve with age.

For Price of Moulds Write

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Hamilton, Ontario

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Our factory is the Most Complete and Modern in Canada for the manufacture of

Fine Hardwood Interior Finish

We are furnishing the Interior Trim for a large percentage of the best Residences, Banks, Churches and other Public Buildings in the country. We also contract for all Carpentry Work. We maintain a high standard of workmanship and material. By specifying our high-grade Fittings, Architects and Contractors are sure of completing the work with satisfaction to themselves and the owner. A million feet of Thoroughly Seasoned Hardwoods always in stock.

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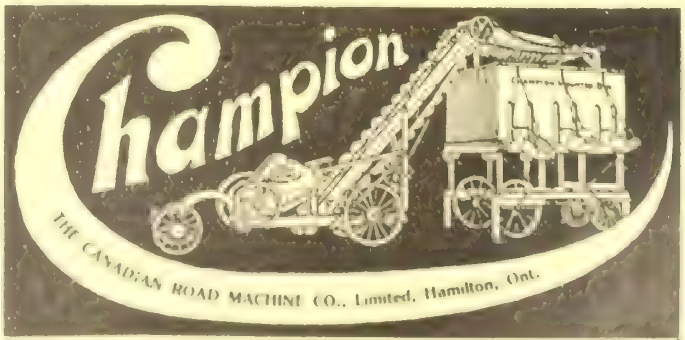
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THE CANADIAN ROAD MACHINE CO., Limited, Hamilton, Ont.

[illegible] Champion Crusher [illegible]

The Chas. Rogers & Sons Co.
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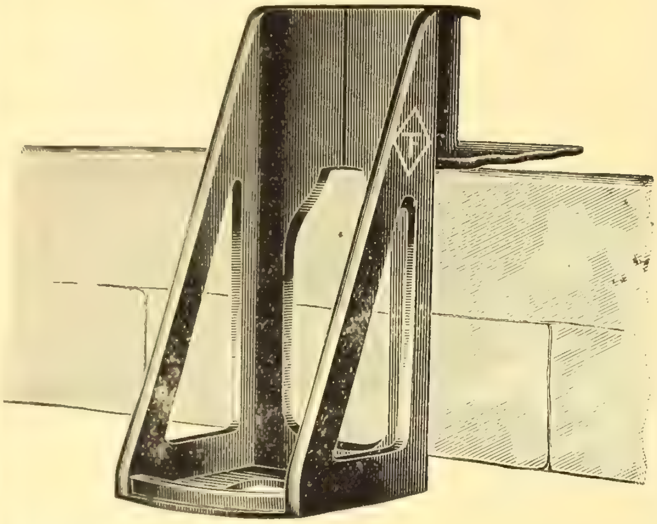
are manufacturers of

High Class Interior Fittings

They have facilities for handling all kinds of this work. Architects and Contractors who have good work on hand ought to consult with them before placing orders elsewhere. Estimates given for all kinds of Carpentry and Interior Fitting Work.

Builders' Joist Hangers
ALL SIZES AND STYLES



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If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalogue we will send one on request.

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Samples sent Free Hardens with Age Correspondence Requested

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- **Also enormous quantities for the PACIFIC COAST, AUSTRALIA, ENGLAND, SOUTH AFRICA, &c.** -

There is always a certain trade who will pay for the best. We also make American Alsen, the highest grade of domestic Portland cement.

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Strength, Durability and Efficiency

All sizes 3 inches to 36 inches single and double strength

Write for catalogue "C" showing our range of **Sewer Pipe, Fire Brick, Wall Coping, Flue Liners, Chimney Tops.**

We quote F. O. B. your town.

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Salt Glazed and Vitrified
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True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

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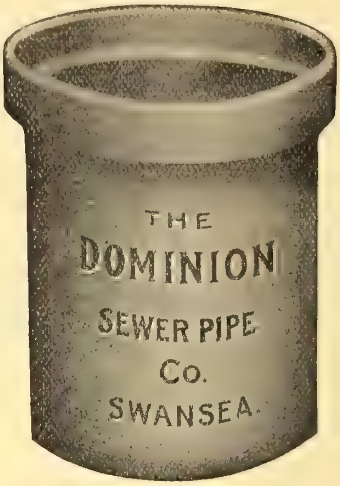

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Let us get acquainted.

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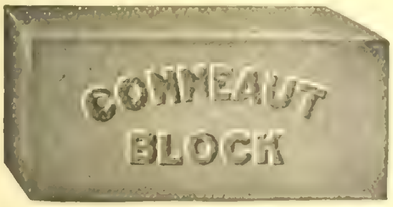

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HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

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Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, for foundation work	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b. with 30 and 5 per cent. off for wholesale:—

	Star	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7.25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, any color, ¾-in. square, 1-in. hex. and 3-16-in. round, 35 cents per square foot up.
Floor Tile—½-inch square, 45 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 35 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish, colors, firsts, 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G. cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Brass Goods, Valves, etc.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.
Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.
No. 4 compression bath cock........net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Furnaces, 45 per cent.; registers, 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.; other specials, 40 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00

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Size. (per 100 ft.)	Black.	Size.	Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 70; malleable bushings, 67½; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 67½ per cent.

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Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.

7 and 8-inch pipe, 40 per cent.

Light pipe, 60 per cent.; fittings, 70 per cent.

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Cement, barrel lots in bags, delivered, Toronto, bags extra, $1.70.

Cement, wholesale lots of 1,000 barrels, f.o.b. Toronto, $1.30.

Crushed stone, $1.25 per ton, f.o.b. Toronto.

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $13.50 to $15 per toise.

Free stone, delivered, $13.50 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.20 to $1.25 per ton.

Scotch fire brick, delivered, $30 to $35 per thousand.

Steel channels and beams, $2.75 per 100 pounds, delivered.

Lime, per cwt., delivered, 38 cents.

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plasters, $5.50 per ton.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $7.50 to $8.00 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs.

Pure Green Seal Zinc White, ground in oil, $12.50 to $13.00 per 100 lbs.

Boiled Linseed Oil, in barrels, 78 cents per gallon of 9 lbs.

Raw Linseed Oil, in barrels, 75 cents per gallon of 9 lbs.

Turpentine, in barrels, 80 cents per gallon of 8 4-10 lbs.

Pure Linseed Oil Putty, 25-lb. tins, $3.25 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $2.75 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

P. Legare & Fils, contractors, Montreal, Que., it is stated, have assigned.

The Brick Company, Limited, Weston, Ont., are stated to have assigned.

Prouix Bros., brick manufacturers, Richmond, Que., it is stated, have dissolved.

La Compagnie [illegible], Montreal, Que., are stated to have dissolved.

Sherbrooke Canadian Foundry, Sherbrooke, Que., it is stated, have dissolved.

Ontario Motor Supply Company, Limited, Toronto, Ont., incorporated, capital $40,000. Incorporators: G. Gray, mechanic, Mary Arnold, account, both of Toronto.

Molesworth Independent Telephone Company, Limited, Molesworth, Ont., incorporated, capital [illegible]. Incorporators: [illegible] and others, farmers, of the township of Grey, Ont.

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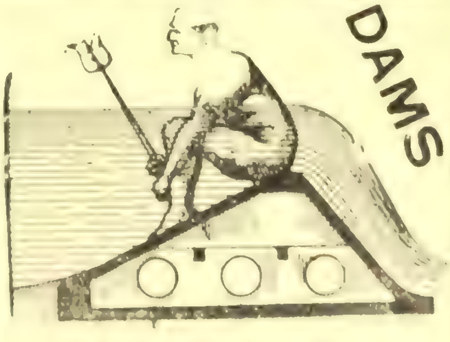

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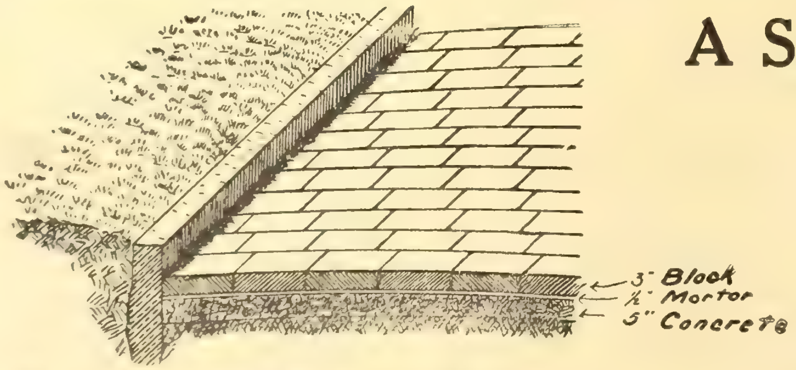

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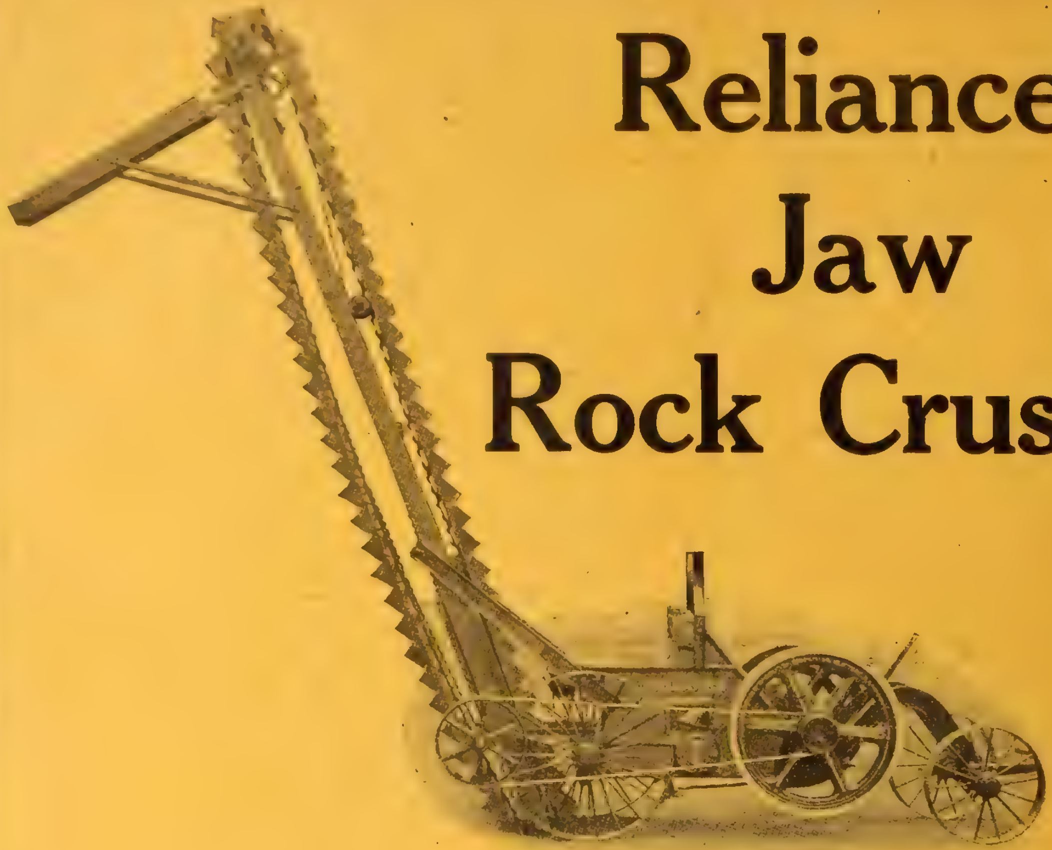

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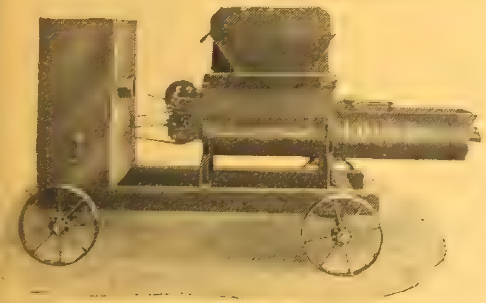

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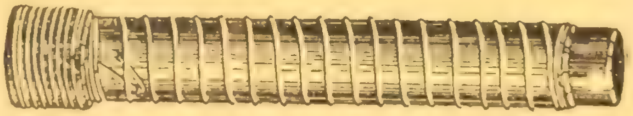

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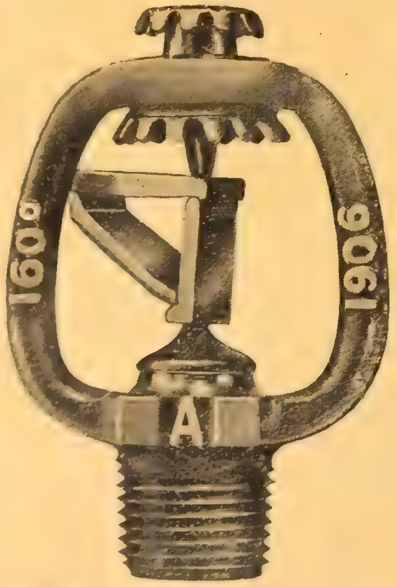

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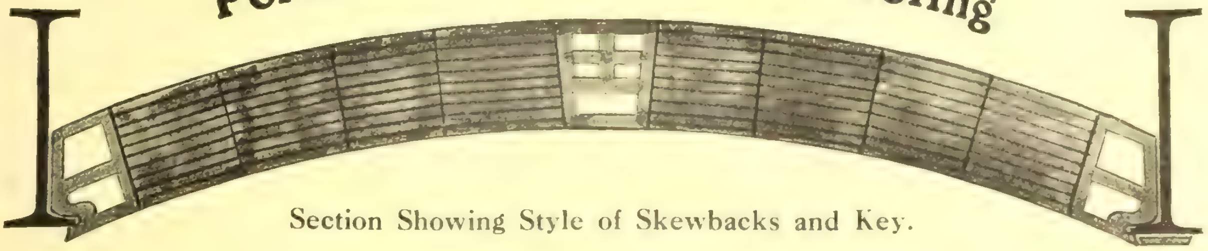

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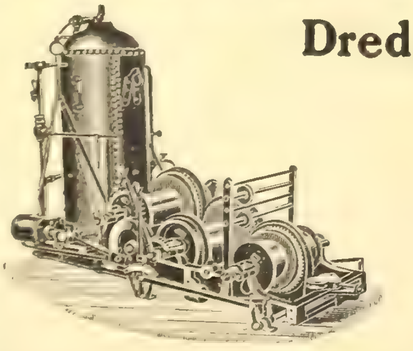

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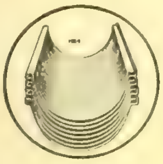

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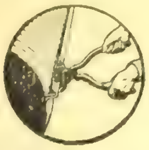

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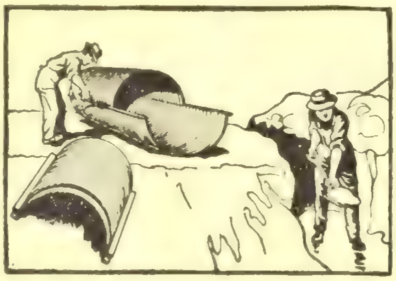

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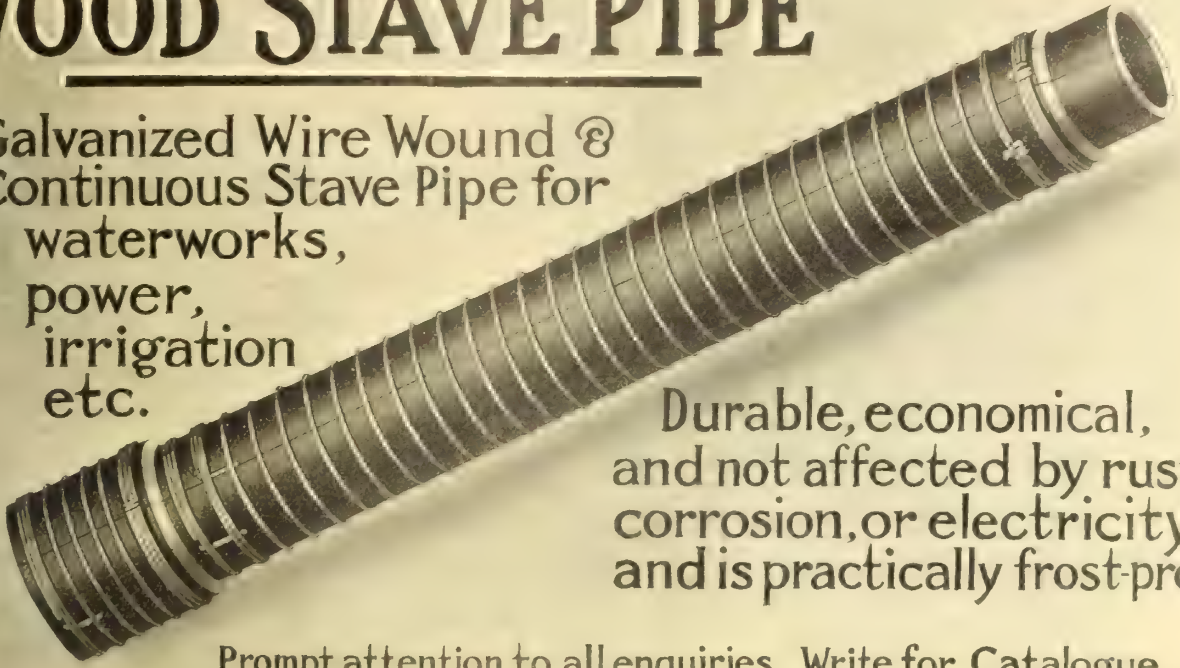

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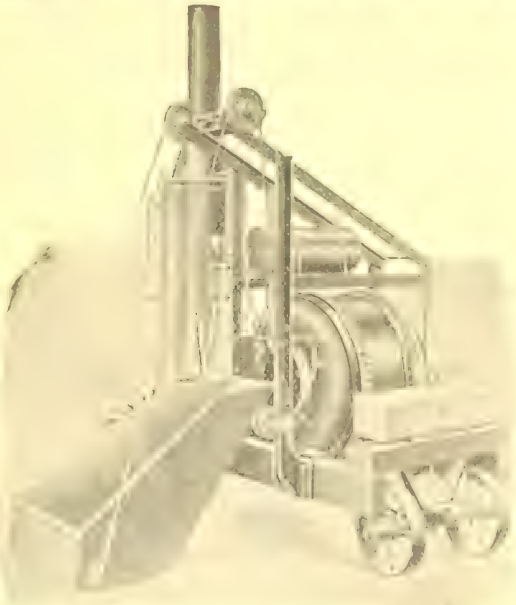

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Architects and contractors desirous of making or keeping a good reputation will do well to recommend this brand

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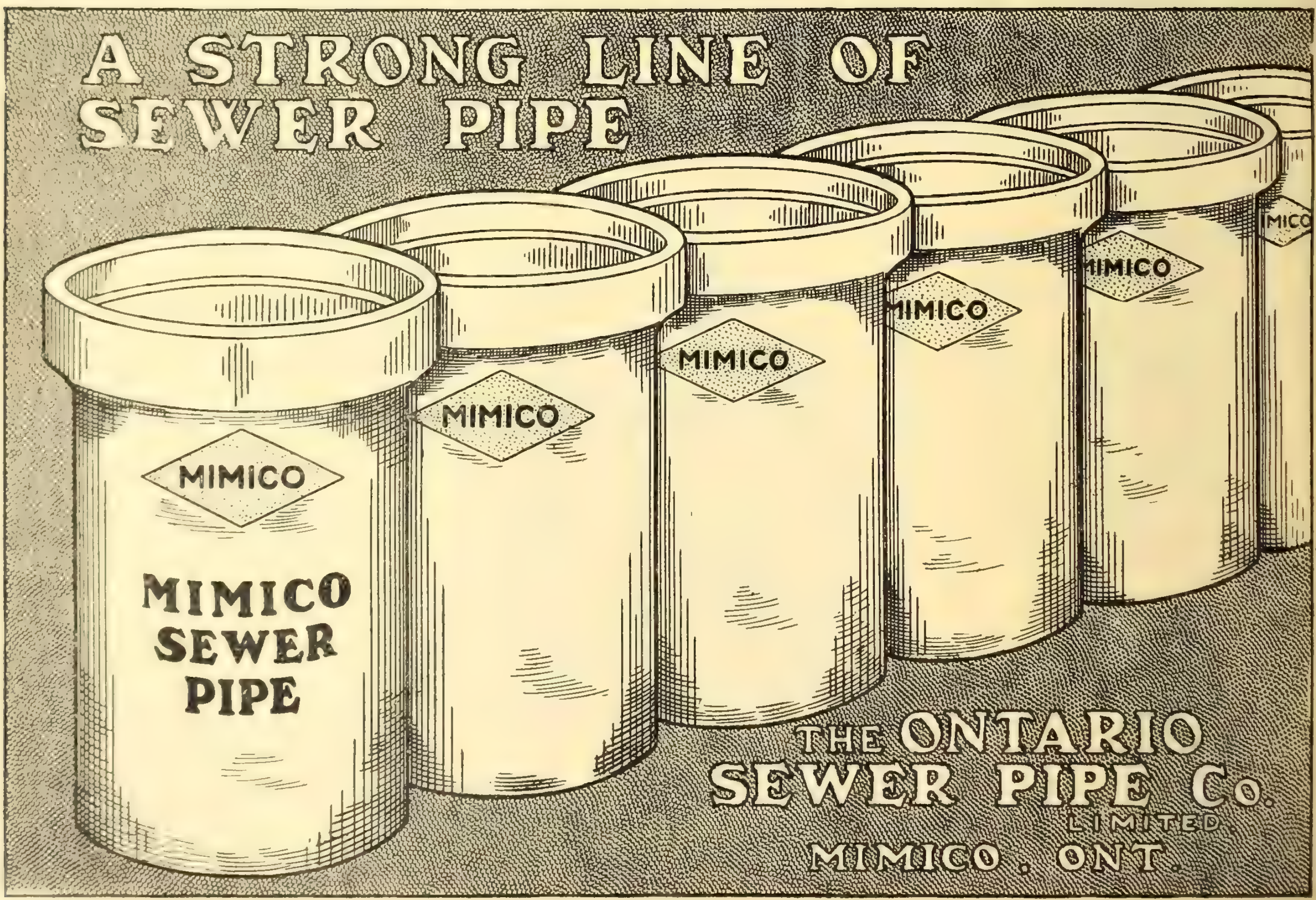
Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**



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Toronto - Canada

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Insist that the Specification be Followed!

For certainty of results, specify that your building shall be roofed *according to The Barrett Specification.*

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Don't say "a Gravel roof", or "a Pitch and Gravel roof", or "a Slag roof", or "a Tar roof"—that is inviting trouble. Say "according to The Barrett Specification." Insist that the full specification be followed.

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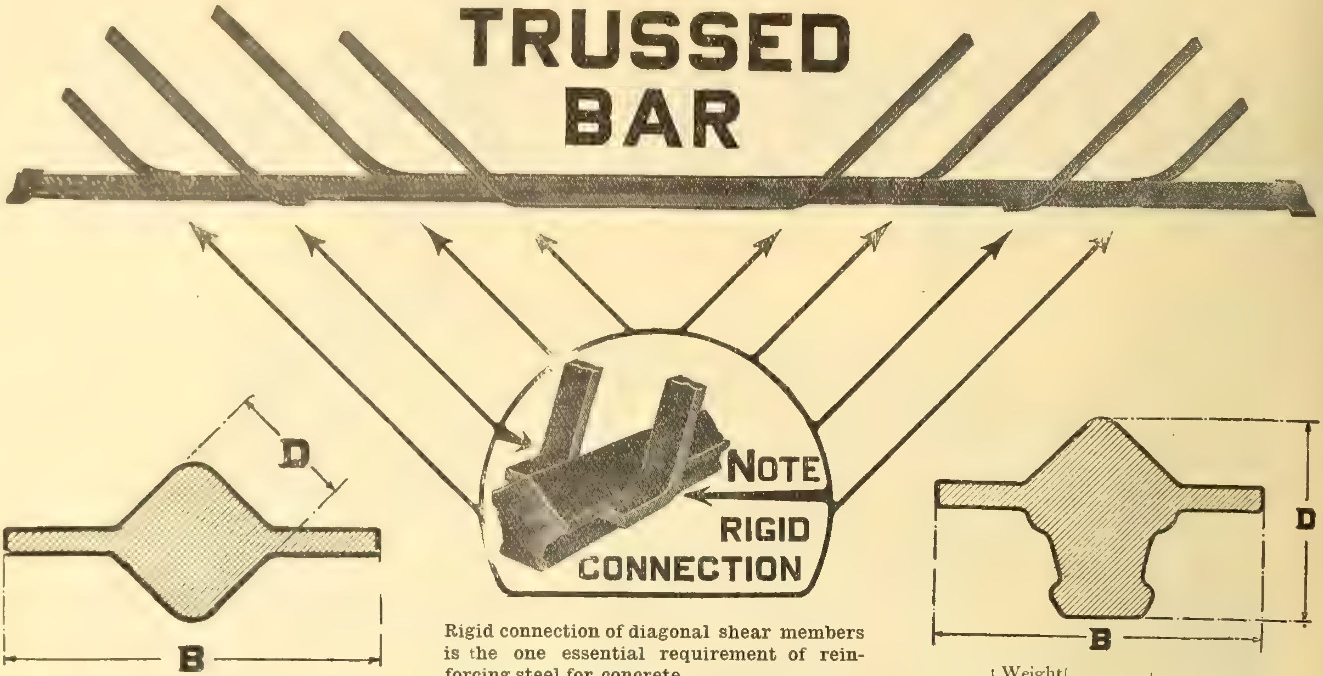
KAHN TRUSSED BAR



D. & B.	Weight per lineal foot	AREA	Lengh of Diagonals
[illegible] x 1½ in.	1.4 lbs	0.41 sq. in.	6 in., 8 in., 12 in.,
[illegible] x 2 3-16 in	2.7 lbs.	0.79 sq. in.	12 in., 8 in., 18 in.,

Rigid connection of diagonal shear members is the one essential requirement of reinforcing steel for concrete.

Kahn Trussed Bars are shipped cut to exact length—Bars up to 60 feet are carried in stock. Any desired length of diagonal or type of shearing can be furnished.

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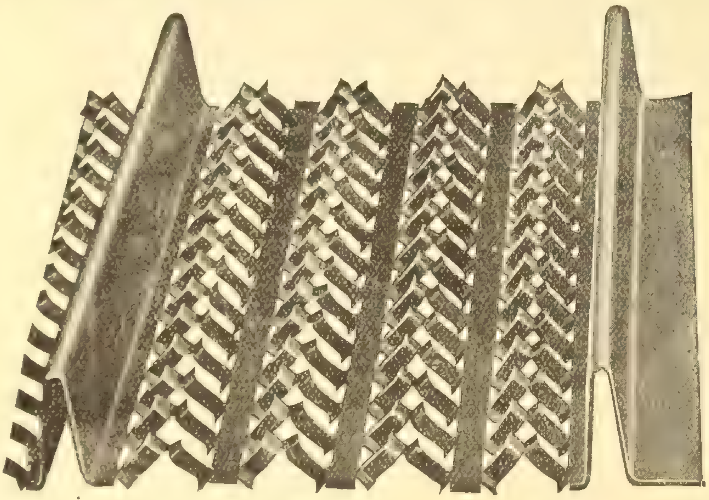
1½ x 2¼ in	4.8 lbs.	1.41 sq in.	24 18, 30, 36 inch
1¾ x 2¾ in.	6.8 lbs	2.00 sq. in.	24, 18, 30, 36 inch
2 x 3½ in.	10.2 lbs	3.00 sq. in.	30, 24, 36, 48 inch



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A unit of lath and studs for Walls, Partitions and Ceilings.

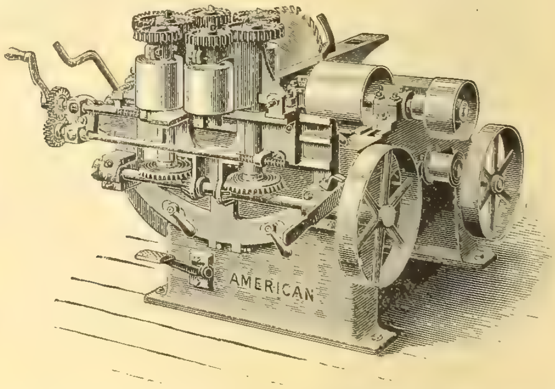
Width of **Hy-Rib** sheets, 10½ inches. Standard lengths, 6 ft., 8 ft. 10 ft. and 12 ft. Intermediate and shorter lengths as ordered.

Ribs of **Hy-Rib** are 13-16 inches high and 3½ inches apart.

Hy-Rib is furnished in either flat or curved sheets. The shop-bending assures absolute accuracy of curve.

Cross sectional areas of **Hy-Rib** per foot of width : 28 gauge, .165 sq. in., 26 gauge, .198 sq. in.; 24 gauge, .264 sq. in.

Above gauges carried in stock. Other gauges can be supplied within a reasonable time.



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Size No	Width of Standard Sheet	Square Feet per Lineal Foot of Standard Sheet	Area per Foot of Width
2	16 in.	1.33	.54 sq. in.
3	24 "	2.00	.36 "
4	32 "	2.67	.27 "
5	40 "	3.33	.216 "
6	48 "	4.00	.18 "
7	56 "	4.67	.154 "
8	64 "	5.33	.135 "

Catalogues of **Kahn System Products—Kahn Trussed Bars, Hy-Rib, Rib-Metal, Rib-Lath, Rib-Studs, Cup-Bars.** Also catalogues describing tests, structures of every kind, and "Kahn System Standards"—the best handbook on reinforced concrete design.

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The solid construction, rational design and perfect simplicity of our

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make them the ideal installation where heavy and continuous work is required.

Just the thing for **Sand Dredging, Cofferdam and General Contracting Work** where the pumps are to be left in charge of unskilled labor.

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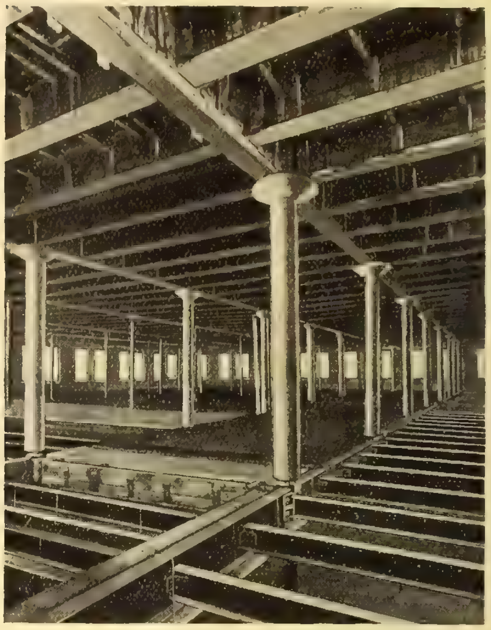

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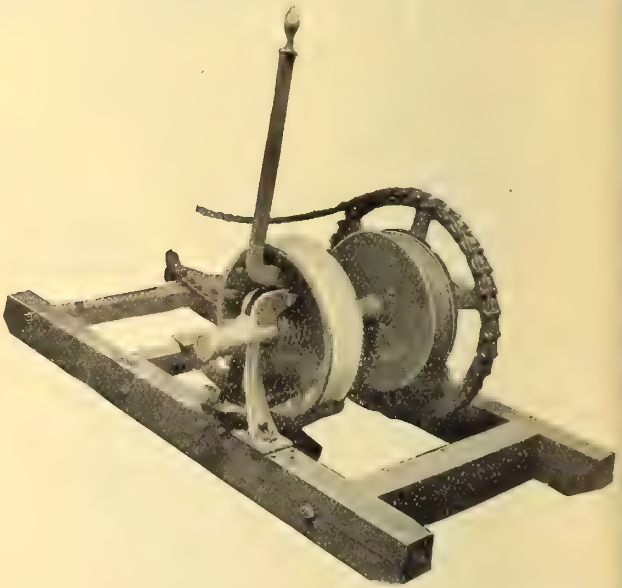

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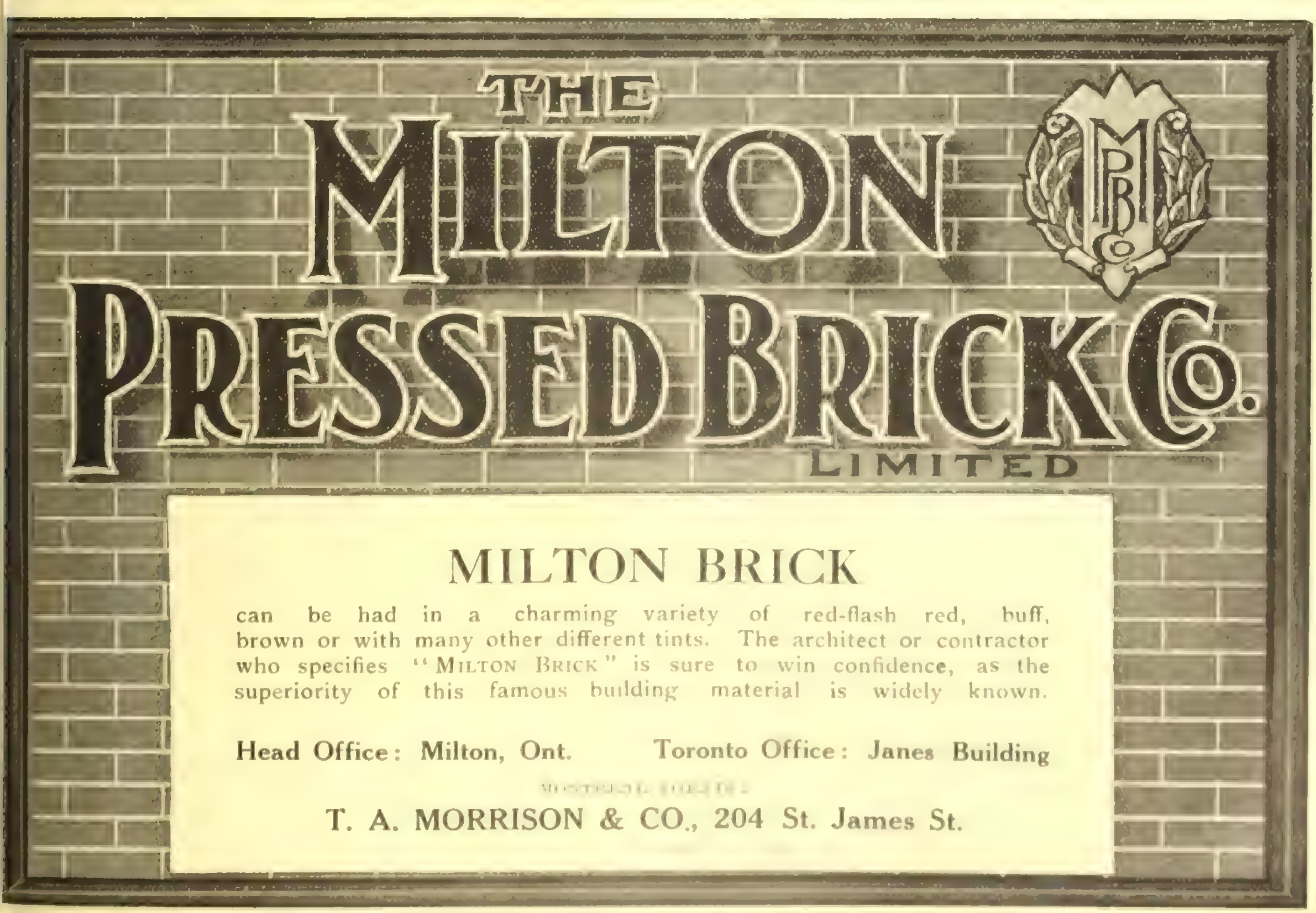

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All Sizes

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It is as genuine stone as manufactured ice is genuine ice. Made from pure white marble with a combination of minerals and everlasting Portland Cement.

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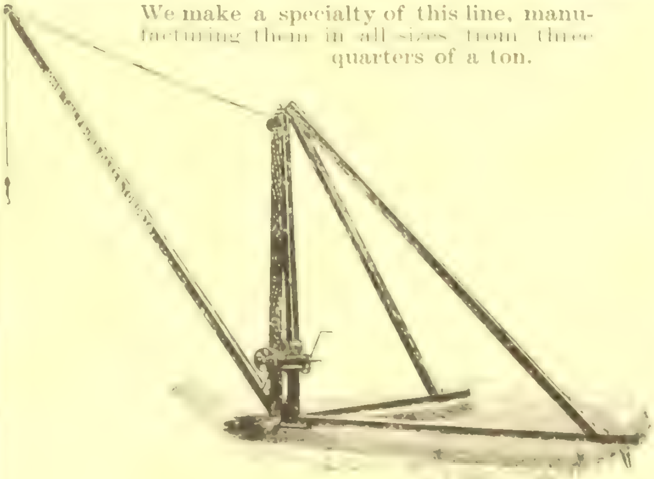
Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the "New State" Concrete Mixer.

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Prices on application

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INVENTED and manufactured by men of life-long experience in the metal-shingle business, the new "Galt" Shingle combines all of the strong points and overcomes the weaknesses of ordinary metal roofings.

The only metal shingle with locks so tight that light cannot penetrate them—consequently, the only shingle that *must be water-tight.* Top and side nailing-flanges. Handsome Gothic Tile design.

If you are at all interested in roofing material you should have our booklet "ROOFING ECONOMY," just off the press. *Name and address, please?*

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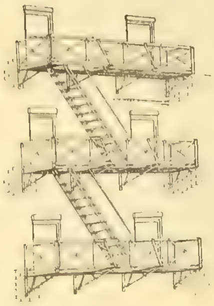

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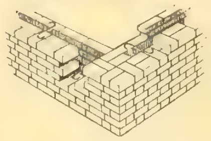

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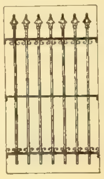

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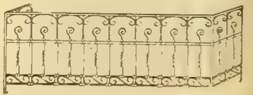
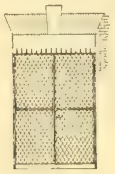
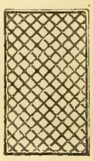


Steel Balcony Railings



Wire Window Guards



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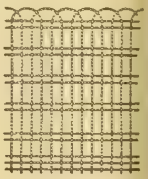

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Everybody knows metal lath is better than wood. Everybody would use it if the cost were right.

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27 gauge cold japanned placed directly on studs or joists spaced sixteen inches on centers is the cheapest **satisfactory** proposition in metal lath. Twenty thousand yards were used thus in Casa Loma Apartments, Winnipeg.

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We have equipped our plant with the best door machinery made, and turn out doors that are right in quality and right in price.

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Prompt deliveries. Write for prices.

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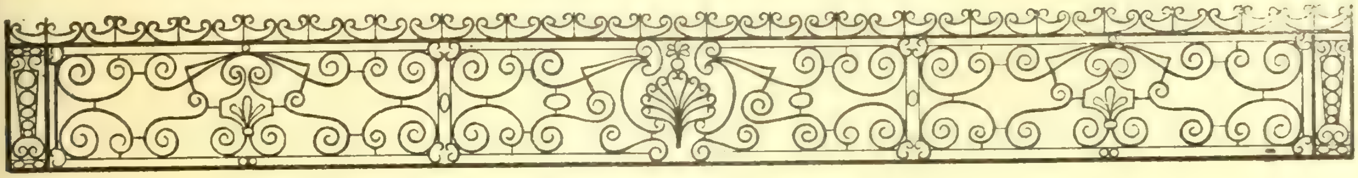

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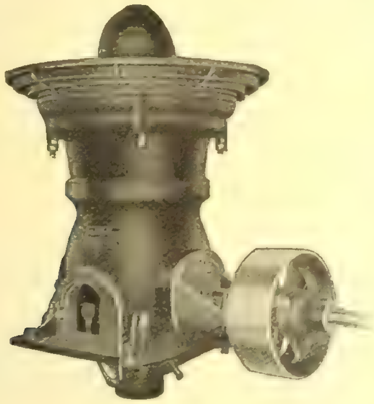

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Investigate a little bit. You'll find the subject interesting, and will want to know more. Begin to-day.

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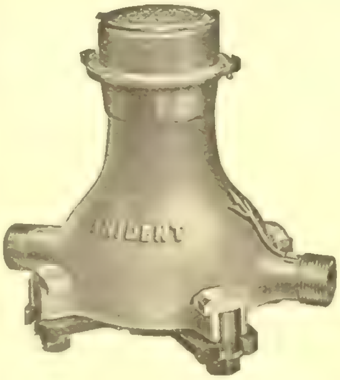
Manufacturers of the Well-known



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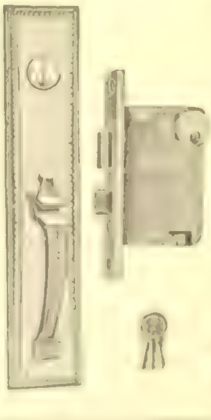

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You may have mailed free to you to-day a catalogue of the

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This book has been made up specially for the use of Architects.

The "Belleville" Brand of Builders' Hardware is of such excellent quality and finish, that you should specify it for all buildings. No other firm in Canada is placing as high class an article on the market as is advertised in this catalogue.

Belleville Hardware Co.
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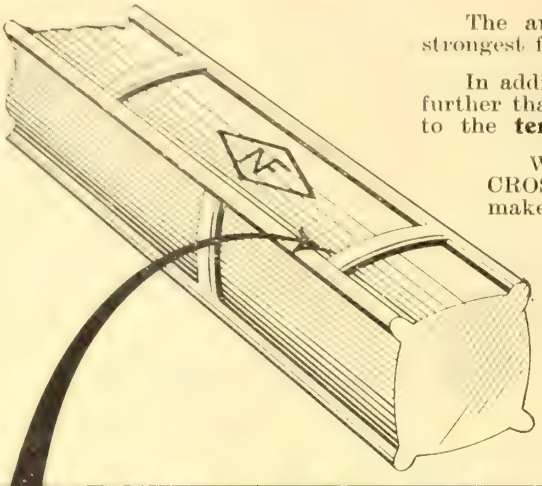
It Adds to Strength and Lessens Strain

Here is a cut of a section of the

"NF" Reinforcing Bar for Concrete



The arrow points out the **longitudinal rib** which is one of its very strongest features.

In addition to the usual advantages claimed for deformed bars, we claim further that the **longitudinal ribs** on the four corners of the (NF) Bar add to the **tensile strength** and prevent **torsional strains** in the concrete.

We have proven this to be an established FACT. In addition the CROSS RIBS form a mechanical bond, so that less metal is required to make a PROVEN BOND under OURS than under any other system.

Does this mean anything else than a SAVING in COST, not only in the **first instance** but so long as the **building will stand ?** Is it possible to figure the case out in any other way ?

We should like to send you some literature on this point, may we ?

ONTARIO IRON & STEEL CO LIMITED TORONTO CAN.

We Manufacture

Frames - Sash - Doors
House Trim

Finest Quality Hardwood Flooring
High Class Interior Work :: ::

OUR ARGUMENTS FOR SOLICITING YOUR BUSINESS ARE EXCELLENT.

New and up-to-date Lumber Dry Kilns, ot 200,000 ft. capacity.
New and well equipped factory with latest and best machinery.
Experienced workmen under the most expert supervision. ::

GIVE US A TRIAL ORDER OUR WORK WILL CONVINCE YOU

Georgian Bay Shook Mills, Limited
Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

harlottetown, P.E.I.

Authority will be asked from the Legis- ature to issue debentures to the amount f $15,000 for the purchase of a new ump.

Guelph, Ont.

The Public Works Committee have rec- mmended the invitation of tenders for 910, tar macadam paving, with concrete ase, and a year's supply of sewer pipe nd cement, while Engineer J. Hutcheon as advised the council to construct a tar acadam pavement on Waterloo avenue t a cost of $27,118.

London, Ont.

Tenders will be received by O. Ellwood, ecretary Water Commissioners, until March 19, for furnishing of the following upplies: Brass fittings, hydrants, valves nd valve boxes, iron castings, cast iron ipe and laying, stopcock boxes, coal, lum- er, oils, lead pipe, hardware, rubber oots, rubber washers, rubber valves, rub- er hose, rubber packing, flax packing, otton waste, brooms, metal polish, elec- ric lamps, lanterns and glasses, Canadian Portland cement. John M. Moore, C.E., ngineer and superintendent.

Montreal, Que.

The Board of Control are asking the City Council for $900,000 to be spent on street repairs; $15,000 will be required with which to engage experts in connec- tion with water supply and filtration

North Vancouver, B.C.

Tenders will be invited for 200,000 feet of sidewalk material required by this municipality. New specifications have been prepared, the tenders received in response to the last call not being satisfactory. Geo. Hanes, City Engineer.

New Toronto, Ont.

Tenders addressed to J. A. L. Macpherson, clerk, Islington, will be received until April 4th for the construction and completion of pipe sewers and appurtenances for a system of sewers at New Toronto. Plans, etc., at the office of the engineers, Murray & McAllister, Continental Life Building, or at the office of the above mentioned.

Regina, Sask.

On March 24th the ratepayers will vote on a by-law for the extension of the water works system.

Sydney, C.B.

The municipality is applying to the Legislature for authority to borrow money for waterworks extension.

Toronto, Ont.

Tenders are being received until April 19th for the various sections of high level intercepting sewer, etc. See advertisement in this issue.

Vancouver, B.C.

Wm. McQueen, City Clerk, writes that the following tenders for galvanized iron pipe and brass were received:—Robertson-Godson Company, pipe, $2,799.50; brass, $3,451.02. Evans, Coleman & Evans, pipe, $2,966.50. A. J. Forsyth, pipe, $2,622.50. Fairbanks Company, pipe, $2,825.70; brass, 3,787. B. C. Supply Company, brass, $3,570.88. Crane & Company, pipe, $2,823.50; brass, $3,356.50. McLennan, McFeely Co., pipe, $2,825.75; brass, $3,524.37. Winterburn, $2,910. Can. Brass Company, brass, 3,930. Barr & Anderson, brass, $3,930. Successful tenderers given in last issue.

AWARDED.

Hamilton, Ont.

The Forwell Foundry Company of Berlin, Ont., have been awarded the contract for the boxings necessary in waterworks construction, $1,143.

London, Ont.

The following contracts have been awarded in connection with equipment for Horton street pump house; turbine pumps, J. McDougall, Caledonian Iron Works Co., of Montreal, for $5,640; motors, dynamos, etc., Lancashire Dynamo & Motom Company, Manchester, England, $11,032; compressors and gas engines, G. H. & H. J. Danels, Stroud, England, 113,000; brick and stone work, B. V. Hole, $9,000. The motor equipment will be ready for installation in June.

Stratford Ont.

The contract for broken stone for sewage plant has been awarded to Messrs. Deacon & Trow at $1.05 per ton f.o.b. Stratford, delivery after March 15. It is estimated that between 7,500 and 8,000 tons will be needed.

Toronto, Ont.

Contracts for five sewers were awarded to the York County Paving Company, the total amount being $4,613.

Vancouver, B.C.

Wm. McQueen, City Clerk, writes that the following contracts were awarded for pavements: Messrs. Warren Construction Company were awarded the contract for Georgia street, (bitulithic pavement); Messrs. Palmer Bros. & Henning for Beatty street (wood blocks), and Messrs. R. S. [illegible] Company for [illegible] street (bitulithic). Noted previously.

Railroads, Bridges and Wharves

Brantford, Ont.

The ratepayers will vote on April 4th on debentures for new bridge over canal, $50,000.

Tenders are being called until April 4th [illegible] advertisement in this issue.

Tenders are being called until April 2nd for the construction of [illegible] quarter miles east of Cainsville, reached by T. H. & B. or G. T. R. Abutments to be of concrete, constructed by municipality, and will conform with masonry diagram, to be furnished by the successful tenderer for the superstructure. Style, Warren truss riveted steel span; length, 80 feet, centre to centre of bearings; width, 14 feet clear roadway; railing, latticed; floor, reinforced concrete, average thickness 6 inches. Tenders are also being called for other works. See advertisement in this issue.

Guelph, Ont.

The city engineer is calling for tenders until March 26th for the construction of a concrete arch bridge over the Speed river. For further particulars see advertisement in this issue.

Huntsvill, Ont.

A deputation has left for Ottawa to seek assistance in improving wharfing facilities here. Mayor, Mr. A. E. Callahan.

Montreal, Que.

The Board of Railway Commissioners are considering an order for the construction of a bridge over the tracks of the Grand Trunk & [illegible] Railway at Rockfield, at the expense of the companies interested.

Ottawa, Ont.

The Railway Committee has passed the bill incorporating the Northern Quebec Colonization Railway. The bill granting an extension to the Kingston, Smith's Falls & Ottawa Railway was also put through along with that incorporating the Erie, London & Tilsonburg Railway.

P. E. Ryan, secretary, Commissioners of the Transcontinental Railway, this city, is calling for tenders ntil April 12th for supply required for the equipment of the locomotive and other shops of the Transcontinental Railway at Springfield east of Winnipeg, Man.

St. Thomas, Ont.

Plans for the erection of the new M. C. R. roundhouse, it is understood, have been completed and, if weather permits, work will commence on the new structure the first of next month. Noted in issue of [illegible].

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman, Board of Control, City Hall, will be received until Maren 22nd for the construction of electrical conduit at railway crossings. Specifications at the electrical branch of the works department City Hall.

Victoria, B.C.

[illegible]

[illegible]

AWARDED.

Calgary, Alta.

The contract for the extension of the Tofield-Calgary line of the Grand Trunk Pacific from Camrose south to Calgary has been awarded at Winnipeg to J. D. McArthur, Limited.

Fredericton, N.B.

The following contracts were recently awarded by Hon. John Morrissy, Chief Commissioner of Public Works: Upper Maugerville low water wharf, Sunbury county, to Edward S. Banks, of Upper Burton, $2,000; Dugway Brdige, Sunbury county, to Whitman Brewer, of St. Marys, $300; Shenstone Bridge, Albert county, to A. E. Smye, of Alma, $4,600; York Mills Bridge, York county, to Frank Boone, of St. Marys, $2,600; superstructure of Shediac Bridge, Westmorland county, to Dominion Bridge Company, Montreal, $13,000; Johnston's Cove arch culvert, Charlotte county, to Joe McVay & Son, St. Marys, contract price about $4,000.

St. Thomas, Ont.

The contract for the superstructure of the Port Burwell bridge was awarded to the Hamilton Bridge Company at $4,840, and for the substructure to the Ontario Paving Company at $2,700. The contract for the Dodd's bridge went to Scoype & Ramey at $2,475. The closest competitors for the work were Powles & Gunning at $2,588, and G. A. Ponsford at $2,649.

Victoria, B.C.

The contract for the new G. T. P. wharf n this city has been awarded to C. J. Johnson & Company, Vancouver and Seattle.

Public Buildings, Churches, Schools, etc.

Arcola, Ont.

The citizens have under consideration the erection of a hospital.

Arrow Parks, B.C.

Tenders addressed to the Minister of Public Works will be received until March 31st for the erection and completion of a large one-room frame school building in the Ymir district. Plans, etc., at office of the Government offices at Nelson Revelstoke and at the office of J. N. Pennock, this place. F. C. Gamble, public works engineer, Victoria.

Brantford, Ont.

The ratepayers will vote on April 4 on debenture propositions, as follows: Public school extensions, $30,000; new market buildings, $100,000.

Brantford County Anti-Tuberculosis Society have had plans prepared for the erection of a consumptive hospital on Strawberry Hill, on the outskirts of the city. Ten thousand dollars have already been subscribed.

Brockville, Ont.

The council have received favorably a proposition made by local capitalists to spend $25,000 on remodelling the opera house.

Chilliwack, B.C.

C. R. Sayer, travelling Y. M. C. A. secretary, has outlined plans for the establishment of a Y. M. C. A. here. Estimated initial cost, building and lot, $8,000. A canvass will be made. Dr. Fraser and N. Anning are interested.

Calgary, Alta.

John L. McLaren, chairman Board of Control, is calling for tenders for painting and kalsomine work and also for the several works required in fitting up a lavatory at the City House of Refuge, for which plans may be seen at the office of Stewart & Witton, architects, Hamilton Provident & Loan Building; also for painting and frosting at the Central Market buildings, and interior painting City Hall. S. H. Kent, city clerk.

Courtland, Ont.

Tenders addressed to D. W. White, clerk, will be received until April 2nd for the reconstruction of the old Town Hall. Plans at office of the above mentioned.

Dunedin, Ont.

Tenders addressed to Angus Campbell will be received until March 19th for the erection of a Presbyterian church. Plans at office of John Wilson, or at office of "The Star," Creemore.

Fredericton, N.B.

In the estimated expenditure brought down by the Provincial Treasurer, $265,000 is mentioned for public works.

Forward, Sask.

A union church will shortly be built here.

Goderich, Ont.

St. Peter's Roman Catholic Church was completely gutted on the 12th inst. Estimated loss, $15,000.

Hamilton, Ont.

Plans for the building of Nurse's Home are being called for until March 21st. Further information at office of Mr. J. H. Grayson, Main street.

Innisville, Ont.

The Anglican congregation are contemplating erecting a new church, to cost about $5,000. Rev. Robert Farney is the rector.

Joliette, Que.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, Ont., will be received until March 22nd for amoury fittings. Plans at above Department, and on application to A. Durand, architect, Joliette, Que.

Kinistino, Sask.

The school building recently destroyed by fire will be rebuilt.

London, Ont.

The Talbot Street Baptist church are considering the erection of a new church. Mr. Walker Finch is chairman of building committee.

Moose Jaw, Sask.

The whole college will comprise three buildings, costing about $300,000. Plans for a 3 storey brick and stone building to cost $10,000 are being prepared.

Medicine Hat, Alta.

This municipality has decided to erect a $10,000 isolation hospital this year. A vote will be taken next month to guarantee the bonds of the Agricultural Society for $10,000. The money will be spent to erect additional stabling.

Montreal, Que.

A petition has been received from the town of Maisonneuve requesting the establishment of a civic public library.

Mr. Rawson Gardner, 812 New York Life Building, is the architect in charge of the erection of the Tabernacle Baptist Church, 309 Delorimier avenue. Estimated cost, $12,000.

Mr. J. Rawson Gardiner, architect, New York Life Building, is preparing plans for a new Baptist Church to be erected on De lorimiere avenue.

It is stated that the Jesuit Congregation of St. Mary have under consideration the extension of their church building on Bleury street. Estimated cost, $300,000.

Mr. Dalbe Viau, architect, 76 St. Gabriel street, is preparing plans and specifications for a new school building containing sixteen class rooms for the Hochelago School Commissioners. This building will be erected on Stadacona street, between Joliette and Chambly streets. It is expected that plans will be finished in the course of two weeks.

New Westminster, B.C.

The proposition of selling the City Hall site and erecting a new civic building over the market square has been advocated by the Board of Trade and will be suggested to the city council shortly.

Niagara Falls, Ont.

Plans for the new armory have been inspected and found satisfactory. It will be 75 by 10 feet constructed of red brick and white stone. The plans call for the expenditure of $70,000.

Prince Rupert, B.C.

The post office here will be erected shortly.

Palmerston, Ont.

Weston Presbyterians will erect a $10-000 Sunday school during the coming summer.

Port Arthur, Ont.

Work is to start shortly on the new Y. M. C. A. building on Algoma street which is to cost $40,000. The plans of D. W. Nichols of Winnipeg, have been accepted.

Rainy River, Ont.

A modern hospital will be erected here.

Regina, Sask.

A by-law to provide for the erection of a $16,000 market building will be submitted to the ratepayers March 24.

St. Catharines, Ont.

Architect A. E. Nicholson was the successful competitor among the four who submitted plans for the Fonthill school. Noted in last issue.

Saskatoon, Sask.

The Trustee Board of the Natuna Methodist Church are getting plans for a church and school to cost $60,000.

Saskatoon, Sask.

The time for receiving tenders for the University of Saskatchewan has been extended to March 29th.

The citizens have voted down the bylaw to provide $110,000 for hospital extension.

Toronto, Ont.

A communication was received at the Council from the Provincial Government stating that they would purchase the Bloor street site, and that about June 1st they will begin to build. The plans for the Northwest High School were submitted by Superintendent Bishop, and were approved.

The City Clerk was instructed to advertise for tenders for the construction of the building for the new fire alarm system. Fire Chief Thompson having reported that the matter was of great urgency, as the present system is totally inadequate to the city's needs.

The by-law to raise $250,000 for the new Toronto General Hospital and $271,000 for water works extensions will be submitted on April 9th.

Tenders addressed to E. S. Caswell, secretary-treasurer, public library, will be received until March 29th for the supply of hardware for the Branch Library, corner of Gerrard street and Broadview avenue.

The permit has been granted for the new Wychwood Presbyterian Church at the corner of St. Clair avenue and Vaughan road, to cost $25,000.

The Presbyterian Church corner of St. Clair avenue and Vaughan road, will be replaced by a new one to cost $35,000. Rev. W. A. MacTaggart, pastor.

Vancouver, B.C.

A club to be known as the Vancouver Motor Club has been formed, of which the following Vancouver citizens are members: Messrs. B. T. Rogers, C. M. Marpole, R. H. Spencer and others. A site for a club house has been secured about 18 miles from this city. Messrs. John Waterson and Kennerley Bryan, associated architects and engineers, have designed plans.

The building inspector has been instructed to prepare plans at once for the two new fire halls in Fairview and East Mount Pleasant.

Weyburn, Sask.

F. S. St. John will erect an opera house here to seat 1,000.

Wynyard, Sask.

The Church of England will build this year. Mr. Salter, Bosworth street, is secretary.

Winnipeg, Man.

The Kildonan municipality will erect a school on Munro avenue, if the by-law is carried on March 17th.

The Salvation Army contemplate a model farm on which $35,000 will be expended on buildings.

Albert Chamberlain, president British Welcome League, Yonge Street Arcade, Toronto, Ont., was in the city recently. The erection of a building is being considered.

Plans are now being prepared in the school board office for two technical schools which will cost approximately $250,000. These plans will be completed as soon as possible, as it is anticipated work on the buildings will be started early this spring.

At a conference between the Schuberts, and George C. Tyler, of Liebler & Company, New York, it was decided to build twelve new theatres on the Pacific coast and adjacent territory. One of the theatres will be located at Winnipeg, and another at Vancouver and will cost about half a million each.

The building committee has recommended that tenders be called for the new school in the Rosedale district.

Tenders addressed to Jame [illegible] & Son, architects, 310 Enderton building, corner Portage and Hargrave, will be received until March 22nd for the erection of a brick church for the Trustee Board of Young Methodist Church.

Tenders for the erection of the Orpheum theatre on Fort street close on March [illegible]. It is intended to begin construction [illegible] soon as the building season opens, and to rush the building to completion. Plans have been prepared by J. D. Atcheson. Probable cost, [illegible].

The Abbatoir Bill of the Government has been prepared [illegible] tion of $50,000 to assist in the establishment of a public [illegible].

Tenders addressed to J. H. G. Russell, architect, Silvester-Willson Building, will be received until March 15th inst. for the work and materials required in the erection and completion of a [illegible] church for the Fort Rouge Methodist congregation.

AWARDED.

Burk's Falls, Ont.

The Trustee Board of the Methodist Church awarded the contract for the reconstruction of church to P. W. Robinson. W. Trivett, superintendent of work.

Collingwood, Ont.

Tenders for the improvements to Central School were awarded as follows: Masonry, A. Court, $2,800; carpentry, D. Bell, $1,191; plastering and cement, John Lockton, $952; painting and glazing, J. Godden, $340; heating and plumbing, W. Parrott, $5,563. Total, $11,166.50.

Dauphin, Man.

We are informed that the contract for school at Gilbert Plains has been awarded to Craig Bros., of Dauphin, at $19,350. Other tenders were as follows: A. Snyder, $19,560; D. L. Hanks, $21,300; Fraser & Simmons, $20,040; I. F. Hafenbrak, $24,000. The tenders for heating and ventilation have not yet been received.

Dundalk, Ont.

$3,000 will be spent on a new school house.

Hamilton, Ont.

Tenders for the addition to No. 3 police station were accepted as follows: Masonry, Richard Tope, $12,000; carpenter work, Drake & Drake, $3,831; paint, Tamp & Son, $600; plastering, J. Clapham & Son, $1,098; plumbing and gas heating, Drake & Avery, $2,921; roofing, Thos. Irwin & Son, $425. Total, $21,000. Those for the steel cellar aer still to be considered.

The following contracts have been awarded in connection with the erection of the Church of the Epiphany: Brick work, John Aldridge & Son, 273 Crawford street; carpentry, Thos. Painter & Son, 333 Huron street; plastering, T. Gander & Son, 38 Marian street; painting, Joseph McCausland & Sons; steel, W. H. Salter, 97 River street. Total cost, 40,000. Gordon Helliwell, Confederation Life Building, Toronto, architects.

The following tenders were accepted for the Kimberley avenue eight room addition: Masonry, G. T. Grafton, $14,500; carpentry, Frank Armstrong, $7,414; plastering, George White, $2,216; painting, J. R. Robinson, $1,120; plumbing, Keith & Fitzsimmons, $1,500; steam heating, Keith & Fitzsimmons, $2,650; structural steel, W. H. Salter, $4,325; cement work, W. H. Salter, $2,115; ventilation, Johnston Temperature Company, $566; wiring, Hall & Dollery, $61; tiling, A. Gardner & Company, $2,870; steel for tiling, W. H. Salter, $2,115. The total cost of the addition is $36,212, as far as the tenders accepted [illegible] $35,000, and the addition results from sev [illegible] plans by the Board.

Moose Jaw, Sask.

[illegible]

Montreal, Que.

[illegible] Garth & Company, $74,750; Jas. B [illegible] Limited, $76,797.

[illegible]

Church for their new building as follows: Excavation, concrete, brick and masonry work, James Young; carpentry and joinery, Chas. Frost; roofing and damp-proofing, Metal Shingle & Siding Company; plastering, Frank Charles; painting and glazing, W. E. Potter & Sons; electric wiring, McDonald & Willson; plumbing and heating, Alex. Mackay & Company. Mr. Jas. E. Adamson, architect, Coristine Building.

Mr. M. Rubenstein, electrical contractor, St. James street, has been awarded the contract for the electric wiring in the new Arthur School. A. F. Dunlop, Lindsay Building, architect.

Owen Sound, Ont.

Alex. Green and J. C. Grier have been awarded the contract for the erection of the West Methodist Church, $24,737.

Ottawa, Ont.

John Henderson, City Clerk, sends us the following list: Tenders for changes and fittings in Howick Hall, Lansdowne Park, for purposes of Spring Horse Show. Plans and specifications prepared by Architect Noffke: (1) Smith Bros., $1,181. (2) J. W. Featherston, $2,527. (3) A. G. Marshall, $2,600. No. 1 accepted.

Regina, Sask.

Wilson & Wilson were awarded contract for the new school on a bid of $68,730. A Winnipeg bid received was next at $78,000.

Toronto, Ont.

The contract for the roofing and sheet metal work on the Bonar church, College and Lansdowne, has been awarded to A. B. Ormsby, Limited, corner Queen and George streets.

The Minister of Public Works has awarded the contract for the whole of the new north wing to Fred. Holmes & Company, 1113 Yonge street, for $517,000. The new wing will contain the library, Department of Education, Ontario Railway Board and Hydro-Electric Commission. Work will be started on the foundation laid last fall as soon as weather permits.

Residences

Morris, Man.

James Lewis will erect a $7,000 brick residence. Architect, H. B. Rugh.

Montreal, Que.

Lt.-Col. Burland has purchased a lot at the corner of Pine and Cedar avenues, with a frontage on Pine avenue of 225 feet and on Cedar avenue of 375 feet, with the intention, it is stated, of erecting a large residence.

Mr. C. Dufort, architect, La Patrie [illegible] taining twelve dwellings to be erected for the Rodier Estate in St. Henri. These plans will be prepared in the course of two [illegible]

J. Seath Smith, architect, 207 St. James street, has prepared plans for alterations of residence of Mr. F. W. Gross and has called for tenders.

[illegible] Messrs. Ross & Macfarlane, architects, [illegible] for Mr. F. W. Evans.

[illegible] or before March 31st, 1910. Mr. Jas. E [illegible]

[illegible] will be called for on or before 24th March.

for block and flats to be erected on Edward Charles street, Park avenue, for Rolland Desjardins, Esq. Mr. Jas. E. Adamson, Christine Building, architect.

Ottawa, Ont.

J. W. H. Watts, architect, is taking prices for alterations to the residence of Mr. W. P. Davis, Wilbrod street, to cost about $12,000.

J. W. H. Watts, architect, is preparing plans for a residence for Mr. Robt. Craig, Glen Falls, Ont., to be solid brick, and costing about $10,000.

Recent building permits include: Wm. Bishop, brick veneer dwelling, Carling avenue, $4,200; T. J. Somerville, brick veneer dwelling, Harvey street, $2,000; F. L. Campbell, brick veneer dwelling, Nelson stret, $4,000; St. Germain and Fraas, brick veneer dwelling, Carling avenue, $4,000; Jos. Alexander, brick veneer dwelling, McLeod street, $2,500; J. R. Irvin, three brick houses, Bell street, $6,000; W. Lamb, two brick dwellings, Frank street, $6,400.

Smith's Falls, Ont.

R. J. Dougall has purchased lots here on which he intends to build three residences. He has also material on the ground for a house in Winchester, Ont.

Toronto, Ont.

A building permit has been granted to Archbishop McEvay for a two storey brick dwelling on Wellesley stret, near Wellesley crescent, to cost $20,000.

Winnipeg, Man.

McKim & White, the firm of New York architects, Union Bank building, have partially completed plans for a residence to be built in the south end for E. L. Taylor, K.C., $20,000.

H. B. Rugh has completed plans for a $6,000 brick veneer plaster stucco finish residence for A. H. Aldinger, to be erected in Crescentwood also plans for a similar residence for J. H. Tremblay, which will also cost about $6,000.

AWARDED.

Montreal, Que.

J. Montgomery Rodden, architect, 8 Beaver Hall Square, has awarded the contract for interior mantelling and panelling in the house being erected on Roslyn avenue for Mr. Rodden, to V. E. Traversy, Papineau avenue.

The contract for electric wiring in four houses which John Stewart & Company are erecting on Roslyn avenue has been awarded to Mr. Rubenstein.

Mr. Jos. Sawyer, architect, 401 Guy street, has awarded contracts for the erection of a cottage on St. Joseph boulevard, Outremont, for Mr. A. Delorme, as follows: Masonry, Desjardins & Labelle; brick, C. Morin; plumbing, heating and roofing, T. Lessard & Fils; painting and glazing, Joe Guy; electric wiring, J. A. St. Amour; tiling, Robert Ball.

Business Buildings and Industrial Plants

Brandon, Man.

It is stated that the Royal Range Company has secured temporary premises in the Atwell block on Eleventh street for their Western branch.

Chatham, Ont.

It is announced that the negotiations between local capitalists and the Anhut Motor Car Company, of Detroit, have been completed and that the present plant will be enlarged to three times its present capacity.

Cardston, Alta.

The Cardston Implement Company is erecting a two storey brick building for store and office purposes.

Edmonton, Alta.

A half million dollar packing plant is to be erected here shortly by P. Burns & Company, of Calgary.

Tenders are being called by the undersigned until March 18th for the erection of the Canada Permanent Building. Plans, etc., at Builders' Exchange, and at the office of the architect, R. W. Lines, this city.

Georgetown, Ont.

A large extension will be made to the Coating Mills. The Sykes factory will also be enlarged.

Hamilton, Ont.

It is stated that John A. Bruce Company will extend their warehouse and storehouse, and that E. T. Wright & Company will enlarge their factory.

Stewart & Witton, architects, have taken out a building permit for three 3 storey brick buildings on Macnab street, between King and Main streets, for Mr. John A. Bruce, $43,000.

The Hamilton Bridge Company has purchased the Williamson property at the southwest corner of Bay and Barton streets, and intends to commence work at once on a fine office building, fireproof and completely modern in every particular.

Halifax, N.S.

A local report states that a representative of a large English cement manufacturing concern has been investigating the Maritime Provinces as a future field for establishing cement works, to be operated independently of the Canadian merger formed.

Lethbridge, Alta.

J. M. Reding will have a business block, 28 by 60 feet, erected, with public hall overhead.

London, Ont.

The Hobbs Manufacturing Company have a permit for a new factory on York street to cost $10,000.

W. R. Jamieson will build a reinforced concrete building, 40 x 60. Plans, etc., at 74 King street.

Minnedosa, Man.

Tenders are being called until March 28th by the C. P. R. central division for the construction of a new station. Plans, etc., at the office of the Resident Engineer, Brandon, and the Division Engineer, Winnipeg. Frank Lee, Division Engineer.

Macleod, Alta.

C. George will put up a business block. Stone will be used from the Geuge quarries.

Melfort, Sask.

A creamery will be built at once. Ira Mousee is secretary of building committee.

Whitmore Bros. will put an extra brick storey on the laundry and dry cleaning establishment, to cost $8,000.

Montreal, Que.

The sale of 24,000 square feet of property on St. Catherine street west, Westmount, to Mr. Daniel Ford is recorded. It is stated that Mr. Ford will commence the erection of a large store building on this property in the spring. The frontage on St. Catherine street is 200 feet.

Mr. Theo. Daoust, architect, 103 St. Francois Xavier street, will receive tenders until March 16th for the construction of a concrete and steel restaurant building at Isle Grosse Bois, for the International Park & Amusement Company. This building will be 260 feet by 106 feet in extent.

Messrs. Finley & Spence, architect, are preparing plans for additions to the building adjoining Bennet's Theatre, St. Catherine street, for this theatre company. It is expected that the plans will be finished and tenders called for in about ten days.

Mr. L. R. Montbriant, architect, 230 St. Andre street, has prepared plans for the erection of a store building for Mr. M. Ethier at the corner of Visitation and St. Catherine streets. Tenders on this work close March 15th.

Mr. Eugene Payette, architect, 15 St. James street, is preparing plans for the erection of six additional buildings at the corner of Delorimiere avenue and Logan street, for Messrs. S. Barsalou & Company, Limited, soap manufacturers. Mill construction will be employed for the erection of these buildings and they will vary in size from 100 feet to 50 feet to 120 feet by 55 feet. It is expected that tenders will be called on this work in the course of two or three weeks.

Mr. William Harris, president of the Ritz series of hotels in Europe and America while in Montreal arranging for the building of a Ritz hotel, stated that capital had all been subscribed and that construction would start this spring. No site has been selected as yet.

Nelson, B.C.

A large business block will be erected this spring by J. E. Annable, of stone and brick, containing six storeys, and three storeys of offices and apartments.

North Battleford, Sask.

Johnson & Mair will open implement show rooms and a garage at an early date, and will erect an addition to the warehouse immediately, and later on a cement block building.

Ottawa, Ont.

Messrs. Horwood & Taylor, architects, are taking prices for extensive alterations to the Graves Bros.' store, corner Sparks and Metcalfe streets, preparatory to the permises being occupied by Messrs. Beament & Johnston, men's furnishing business.

Hugh Carson, Limited, whose business was destroyed by fire recently, are altering and improving the old Free Press building on Elgin street for occupancy.

The Mark-Brock Enterprises, Limited, of Montreal, are negotiating for a centrally located property for the purpose of erecting a theatre. William Jacobs, A. R. Hall, G. S. McLeish, D. S. Friedman, and L. Fitch, of Montreal, are interested.

Newmarket, Ont.

A local option hotel will be built at Newmarket to cost $40,000.

Ottawa, Ont.

A. Rosenthal & Sons, 113 Sparks street, will erect a 7 storey 69 x 99 building on their property on the north side of Sparks street. Estimated cost, $125,000. Work will be commenced on May 1st.

Port Colborne, Ont.

Application will be made to the Dominion Government for a lease of the vacant land on the east side of the harbor as a site for a cork industry which is anxious to locate here.

Portage la Prairie Man.

A. M. Williams, secretary of the Nelson Paper Company, of Minneapolis, Minn, stated that his firm has found it necessary to erect a factory in Western Canada. Winnipeg and this city are being considered. Mr. Coleman, local secretary, Board of Trade.

It is reported that the Urban Mutual Insurance Company will build in the rear of the post office on Campbell street.

Port Dalhousie, Ont.

The George Wilson Building & Contracting Company of St. Catharines will commence work on a new warehouse for the Maple Leaf Rubber Company as soon as weather permits.

Port Arthur, Ont.

Work on the Port Arthur Steel & Wagon Works will be begun as soon as the building season opens.

Regina, Sask.

W. J. Hammond, furrier, of Winnipeg, has purchased a site here for store building purposes.

Geo. R. Rastail, of the Brush & Overland Company, has decided to invest $150,000 in a manufacturing plant at Regina.

Hang Bros. & Nellemoe Shoe Company, of Toronto, will likely build a warehouse here.

G. S. Wood is to have a fireproof building 50 by 100 feet, costing $25,000. Storey & Van Egmond, architects.

The Walkover & Amherst Shoe Company, and Harry Bros., of Hellenoe, contemplate the building of warehouses here, $2[illegible],000.

A. M. Fraser contemplates erecting a sash and door factory.

Lees & Persse are having a steel and brick warehouse built here.

P. McAra and A. Mowat will have separate store buildings erected. Both will be three storeys, brick. Work to start April 1st.

Mayor R. H. Williams, Ald. Sinton, Ald. Darke, and City Socilitor H. Y. Macdonald have been in Winnipeg negotiating with the various railway companies regarding a union depot.

The following are planning to build: Regina Plumbing & Heating Company, warehouse and office, $40,000; Farmers' Co-Operative Company, J. H. Trainer, agent, warehouse, $15,000; Egg-O-Baking Powder Company, factory, $5,000.

There is talk of Geo. Christie Company, Limited, of Glasgow, establishing a plant in Winnipeg.

Saskatoon, Sask.

Jas. Priel will have a two storey warehouse, 30 by 100 feet, erected shortly.

John East, of Edmonton, will erect a foundry in Saskatoon.

Lemery & Dennison will have a business block erected here. Two storeys, concrete and brick.

St. John, N.B.

Mayor Bullock has received from Ottawa the plans of the proposed sugar refinery to be built by F. C. Durant.

St. Romuald d'Etchemin, Que.

The taxpayers have voted a bonus of fifteen thousand dollars and exemption from taxes to the St. Lawrence Car Works.

St. Thomas, Ont.

The Nursery Shoe Company, of Toronto, have completed arrangements for their locating here. Plans have not yet been made for the new building. A. E. Medcalf is interested.

Property has been purchased at the corner of Centre and Metcalfe streets, on which the foundry of C. Norseworthy Company will be extended.

Toronto, Ont.

The property at the southwest corner of Bay and Barton streets, it is announced, has been purchased by the Hamilton Bridge Works as a site for an office building.

Tenders addressed to Darling & Pearson, 2 Leader Lane, will be received until March 22nd for the various trades required in the erection of a five storey building on the corner of King and Bay streets. Plans, etc., at office of the above.

Uxbridge, Ont.

Tenders are being called until March 21st for the erection of a brick printing office and moving the present office building. Plans, etc., at office of the "Journal."

Vermilion, Alta.

Peter Wiebe, of Langham, Sask., will have a flour mill erected here. Work starts March 25.

Victoria, B.C.

A building permit has been issued for a three storey brick building with frontage of 120 feet on Government street to cost $30,000. Architect, C. E. Watkins, 606 Fort street. Thomas Brydon, contractor.

A permit has been issued to W. K. Houston for a 2 storey warehouse on Fisguard street, south side, between Blanchard and Quadra streets, at a cost of $7,000.

Vancouver, B.C.

The Vancouver Milling & Grain Company called for tenders last week for excavating. Further information may be had at their office, corner of Cambie and Smith streets.

A building permit has been issued to the Dominion Steam Laundry, northwest corner of Lansdowne avenue and Ontario streets. Estimated cost of block, exclusive of machinery, $35,000.

A handsome building of reinforced concrete to be erected on Hastings street for C. Tweedale will be faced with white glazed brick and the ornamentation modelled in cement. Wm. F. Jones, architect.

A store and apartment block to cost $52,000 is to be erected for A. E. McEvoy and E. W. McLead. The building will be of brick, the ground floor being occupied [illegible] upper storeys will be laid out in apartment suites.

Westmount, Que.

It is announced that Daniel Ford, contractor, has purchased [illegible] east, where it is stated, a large store will be built.

Winnipeg, Man.

[illegible] pany. It will be constructed of brick and [illegible]

[illegible] building to be built on Hargrave street, immediately adjacent to the new Enderton block have been prepared by H. B. Rugh, [illegible] ed for the Winnipeg Land & Mortgage Company at a cost of approximately $15,[illegible].

McElroy & Hurtubise, of Montreal, are contemplating early erection of a $40,000 tannery at St. Boniface.

Tenders are wanted, separate or bulk, for excavation and erection of stone and brick apartment block. A. C. Gardiner, 496 Main street.

A fur goods factory is to be put up on Princess street by several ex-Hudson Bay Company's men.

The Manitoba Glue Company will erect a plant. John McKay, Jas. Power and H. E. Ridgedale are interested.

The sale is reported of the southwest corner of Flora avenue and Main street by J. C. Miller, to an Eastern firm. It is said that the new owners will use the property as a site for a factory and that an extensive plant will be erected.

The Thomas Ryan Shoe Company will erect a big warehouse at Saskatoon.

Lewis & Edwards have secured a permit for the erection of a store building, corner of Rathgar and Pembina, $7,000.

J. W. Sherwin is the financial agent for the seven storey office building to be erected on Smith street at an approximate cost of $100,000.

Carter, Halls & Aldinger are the contractors for the $30,000 garage which is being erected on Garry street in the rear of the Free Press building. Alloway & Champion, financial agents.

W. W. Blair, architect, is calling for tenders for the purchase and removal of the buildings on the O'Connor hotel site.

The Mullins' Tanning Company are under the necessity of again enlarging their building.

D. Bellhouse, architect, has plans completed for Dr. Martin's $25,000 building, and tenders are wanted.

The Doty Engine Works Company, of Toronto, Ont., (F. W. Doty, of Toronto, superintendent), has obtained a site for its proposed shipyard at the foot of Water street; in connection therewith the company will operate a machine shop and boiler works for the construction of the machinery required in building steam craft.

Yorkton, Sask.

The Bank of Toronto will erect a three storey building.

AWARDED.

Calgary, Alta.

Contract was awarded to the Carter, Halls, Aldinger Company, of Winnipeg, Man., for a 6 storey business block for Leeson & Lineham. It will be of cement and concrete construction and will cost [illegible]

Humberstone, Ont.

The contract for the construction of the Imperial Bank building has been let to P. S. Peacock, of Welland.

Montreal Que.

[illegible] Belmont street, have awarded contracts for the remodelling and alterations to the [illegible] 1 Beaver Hall Square, as follows: General contract, C. J. Brown; roofing, Geo. W. [illegible] heating, Jas. Ballantyne; electric wiring, [illegible]

[illegible]

Continued on page 29

Tenders and For Sale Department

CITY OF STRATFORD

Tenders will be received until 5 p.m. March [illegible], 1910, for approximately 67,000 square yards of Pavement. Specifications and particulars may be had on application. Lowest or any tender not necessarily accepted.

M. FERGUSON,
City Engineer.
11

To Heating Contractors

Sealed tenders addressed to the undersigned will be received until noon on FRIDAY, THE 8TH OF APRIL, 1910, for the installation of a Steam Heating System to heat the Court House and County Buildings in Peterborough.

Particulars for guidance of parties tendering can be had on application to the undersigned.

ED. M. ELLIOTT,
County Clerk.
Peterborough, March 5th, 1910. 12

Tenders For
Gas Franchise

Bids, sealed and endorsed "Gas Franchise," will be received by the City Clerk of the Corporation of the City of Fort William, up to APRIL 1ST, 1910, for the letting of a Gas Franchise, including construction of Plant, Mains, etc., and operation.

Conditions, specifications and form of tender, on which bids must be submitted, can be obtained from the undersigned.

Lowest or any tender not necessarily accepted.

JOHN WILSON,
Assistant City Engineer,
12 Fort Wililam, Ont.

TENDERS
University of Saskatchewan

Sealed tenders, addressed to the undersigned, will be received not later than the 29TH DAY OF MARCH, 1910, for the different trades required in the erection of the College Building, Students' Residence, Power House, Live Stock Pavilion, Agricultural Engineering Building, on the University Grounds in Saskatoon.

The right to reject any or all tenders and to waive any defects or irregularities therein, is to be at the discretion of the Board of Governors.

Tenders are to be made on forms furnished by the architects.

Each tenderer is to enclose with his bid an accepted cheque for 10 per cent. of the amount of his tender, which deposit will be forfeited if the tenderer fails to execute the contract and bond when requested, and will be returned to the unsuccessful bidders when the contract is signed.

Plans and specifications may be seen at the office of the University, Saskatoon, Sask., or at the office of the Architects, David R. Brown and Hugh Vallance, Canada Life Building, Montreal, Que., and at the rooms of the Builders' Exchange, Winnipeg, Man,

WALTER C. MURRAY,
President.
Saskatoon, Sask., February 21st, 1910. 11

Tenders For
Gaol Heating

Tenders will be received by the undersigned up to noon on SATURDAY, MARCH THE 19TH, 1910, for the heating of the County Jail at the Town of Barrie, according to plans and specifications which may be seen on application to H. W. Beardsley, County Clerk's Office, Court House, Barrie. All tenders to be sealed and marked "Tenders for Goal Heating" and addressed to

C. J, PICOTTE,
Chairman County Property Committee,
12 Box 128 Penetanguishene, Ont.

Tenders for Bridge

Sealed tenders, addressed to the undersigned, will be received up till 10 o'clock a.m., on MONDAY, THE 4TH DAY OF APRIL, 1910, for supplying and erecting an 80-foot span Steel Bridge over Fairchild's Creek in the Township of Brantford.

Further particulars may be had on application to the undersigned.

The lowest or any tender not necessarily accepted.

J. A. SMITH,
Township Clerk.
Brantford, March 8th, 1910. 11

Tenders for
High Level Intercepting Sewer, Toronto

Sealed tenders, addressed to the Chairman of the Board of Control, City Hall, Toronto Canada, endorsed "Tender for Section No, 1, High Level Interceptor" or "Tender for Don Syphon, High Level Interceptor," etc., as the case may be, for the construction of the several sections of High Level Interceptor mentioned below, will be received by registered post only, until noon of TUESDAY, APRIL 19TH, 1910.

The following are the sizes and approximate lengths of the various sections:

1. Section No. 8, flattened shape, 1216 linear feet, 7-foot 10-inch by 10-foot.
2. Section No. 7, circular, 3246 linear feet, 9-foot 6-inch diameter.
3. Section No. 1, circular, 2072 linear feet, 9-foot 3-inch diameter; and 1336 linear feet, 9-foot diameter.
   (Total length Section No. 1, 3408 linear feet.)
4. Section No. 2, circular. 2993 linear feet, 8-foot 9-inch diameter.
5, Don Syphon (crossing under River Don).

Specifications may be obtained from, and original drawings will be on file and can be seen at the Main Drainage Department, City Engineer's Office.

For the convenienec of contractors, sets of blue prints have been prepared and will be issued to contractors upon the deposit of $10.00, which amount will be refunded upon return of blue prints in good condition within thirty days of receiving tenders.

The usual conditions relating to tenders as prescribed by City By-law must be strictly complied with or the tender will not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman, Board of Control.
City Hall, Toronto, March 10th, 1910. 12

Tenders for Bridge

Sealed tenders will be reecived by the undersigned up to noon on SATURDAY, MARCH 26TH, 1910, for the construction of a Concrete Arch Bridge consisting of three spans of 33 feet each, over the River Speed about three miles north of this City.

Plans, specifications and form of tender may be obtained upon application to the undersigned.

The lowest or any tender not necessarily accepted.

JAMES HUTCHEON,
Engineer.
Guelph, March 14th, 1910. 12

TENDER

City of Moose Jaw, Sask.

Pavments and Sidewalks

Sealed tenders addressed to the undersigned and endorsed "Tender A,," "Tender B." and "Tender C.," will be received until 8.30 o'clock p m. on MONDAY, APRIL 11TH, 1910.

Contract "A"—Furnishing material for and constructing 33,300 square yards of pavement.

Contract "B"—Furnishing material and constructing 13,500 lineal feet of combined curb and gutter.

Contract "C"—Furnishing material for and constructing 116,500 square feet of concrete sidewalk.

Plans and specifications and form of tender may be obtained at the office of Angus Smith, City Engineer, Moose Jaw, Sask.

The lowest or any tender not necessarily accepted.

(Sgd.) W. F. HEAL,
City Clerk.
Moose Jaw, Sask. March 8th, 1910. 12

Department of Railways and Canals

Sault Ste. Marie Canal

Tenders for Supplies
for the year 1910

SEALED TENDERS addressed to the undersigned and endorsed "Tender for Supplies," will be received at this office up to 16 o'clock on THURSDAY, THE 17TH MARCH, 1910, for the supply and delivery of Timber, Hardware, Electrical and various other supplies required for use on the Sault Ste. Marie Canal for the year 1910,

Specifications, forms of Tender and full information may be obtained at the office of the Superintending Engineer, Sault Ste. Marie, Ont., on and after Monday, the 28th February, 1910.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 28th February, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 11

Tenders for
Concrete Work

Sealed tenders, addressed to the undersigned, and marked "Tender for Bridges," will be received up till noon, on SATURDAY, THE 2ND DAY OF APRIL, 1910, for the construction of the following works in the Township of Brantford:—

1. Concrete abutments on piles for the Rispin Bridge 80 feet span.
2. A reinforced concrete bridge, 24 feet span.
3. A reinforced concrete bridge, 16 feet span.
4. An 8-foot concrete arch.
5. A 6-foot concrete arch.

Plans and specifications may be seen at the office of the undersigned, or at the office of W. H. Fairchild, C.E., Township Engineer.

The lowest or any tender not necessarily accepted.

J. A. SMITH,
Township Clerk.

Brantford, March 8th, 1910. 11

Plant for Sale

For Sale:—The following Second-Hand Plant, located at Durham, Ont., or portion thereof. The whole lot at a reduced price,

25 No. 3 American, square pan, wooden hub, Wheel Scrapers.
28 No. 3 K. & J., round pan, iron hub, Wheel Scrapers.
6 No. 3 Western, square pan, with doors, Wheel Scrapers.
7 No. 2, K &J, round pan, iron hub improved, Wheel Scrapers.
55 Doors and Gates, for No. 3 Wheel Scrapers.
27 Slush Scrapers.
15 Light and Heavy Plows.
Located at Three Rivers, Que.
One Large Travelling Clam Shell Derrick.
One Steam Pile Hammer (Cram Patent), with Steam Hose.
One Thomas Automobile (Model 31), 60 h.p., thoroughly overhauled and painted; location, Toronto.

THE RANDOLPH MACDONALD CO., LIMITED,
14 Crown Life Building, Toronto, Ont.

City of Brantford
Sewer Construction

Sealed tenders addressed to Ald. Joseph Minshall, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock noon on THURSDAY, MARCH 31st, 1910, for the furnishing and laying of about 2,180 feet of 12-inch extra strength Sewer Pipe, and 705 feet of 12-inch Cast Iron Pipe, together with 12 manholes; greatest cut 31 feet; average cut, 16½ feet.

Plans and specifications may be seen and instructions to bidders, and forms of tender obtained at the City Engineer's Office.

Each tender must be accompanied by a marked cheque for 5 per cent. of the amount of the tender.

Copies of the plans and specifications may be seen at the office of the Contract Record, Confederation Life Building, Toronto, and at the Board of Trade Building, Montreal.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.

City Hall, Brantford, March [illegible], 1910. 14

The B. C. Gazette gives notice of the incorporation of the following [illegible] Cedar Cove Sash & Door Company, Limited, capital, [illegible]; [illegible] Company, Limited, capital, [illegible] agan Lake Lumber Company, Limited, capital, [illegible] the [illegible] Hardware Company, Limited, capital, $25,000.

Business Buildings and Industrial Plants

(Continued from page 27.

the Royal Trust Company's Building on St. James street. Messrs. Peden & McLaren, architects, 17 St. Alexis street. It is understood that the sub-contracts have also been arranged.

A. Mongeau has been awarded the general contract for the erection of four stores and four dwellings on Craig street, for Messrs. Bloomfield Bros.

Ottawa, Ont.

W. E. Noffke, architect, has awarded a contract to Thos. James and A. G. Marshall, for extensive alterations to the basement of Central Chambers, costing $12,000.

Prince Albert, Sask.

The contr[illegible] has been awarded to T. E. Baker. Cost, $40,000. Tenders are now wanted for the heating.

Toronto, Ont.

The contract for the Terne Clad Doors for No. 4 factory of the T. Eaton Company has been awarded to A. B. Ormsby, Limited, corner Queen and George streets.

Three Rivers, Que.

The contracts for the erection of a pipe foundry and cleaning house for the Canadian Iron & Foundry Company, Limited, have been awarded as follows: Steel erection, Structural Steel Company, Limited, Longue Point, Que.; general contract, E. G. M. Cape, Montreal.

Power Plants, Electricity and Telephones

Moose Jaw, Sask.

S. P. Porter, Deputy Minister of Railways and Telephones, has announced that the Department would spend $125,000 in the city this year. A completely new telephone system will be installed and a handsome exchange building erected, a site for which has already been purchased. The Department had also decided to complete the long distance line to Outlook this year, a distance of 125 miles, and possibly one from Moose Jaw to Swift Current.

Norwich, Ont.

This municipality proposes to take 150 horse-power at $30 per horse-power, and Tilsonburg 500 horse-power at $30.50 from the Hydro-Electric Commission.

Niagara Falls

The programme for the coming year for the Ontario Power Company includes the immediate installation of a second 18 foot [illegible] vations for the third and final tube.

Ottawa, Ont.

[illegible] to City Engineer Ker's estimate, will be $75,000. The cost will likely be the same for either of the two routes suggested.

Parry Sound, Ont.

[illegible] intendent.

Peterborough, Ont.

[illegible]

Prince Rupert, B.C.

The Prince Rupert Telephone Company, has entered into a contract with the Dean Electric Company, of Elyria, Ohio, for a telephone system to cost $10,000. The system will be turned over to the city when incorporated.

Port Arthur, Ont.

The Hydro-Electric have entered into a contract with the Kaministiquia Power Company to supply the City of Port Arthur with electric power up to 5,000 h.p.

Officials of the Western Dry Dock & Shipbuilding Company state that the Government having definitely promised aid to the extent of three per cent. on the investment contracts for several buildings and plans will immediately be let.

Regina, Sask.

The Legislature has been asked for authority to enable the city to construct and operate a street railway and electric power, lighting and heating plants, also for the authority to purchase a transfer railway connecting the three railways now in operation at an estimated cost of about $10,000.

Stirling, Ont.

On March 21st the ratepayers will vote on a by-law to issue $10,000 20-year 5 per cent. electric light debentures. G. G. Thrasher, clerk.

Toronto, Ont.

The Monarch Railway Company was refused permission to enter the city of Toronto by the Railway Committee of the Legislature.

Tenders addressed to G. R. Geary, K.C., chairman Board of Control, will be received until March 22nd for the building of two vaults and the supply, fitting and installation of office fixtures, in the offices of the Toronto Hydro-Electric System, City Hall. Specifications, etc., at the offices of the property department, City Hall.

Weymouth Bridge, N.S.

We are informed that the contract for the installation of the electric plant mentioned in our last issue has not been closed yet, further capital being required.

Winnipeg, Man.

A conduit will be constructed from the terminal station in Point Douglas to the proposed McPhillips street sub-station. Tenders for the latter will be called for as also for the conduit. The expenditure for the year's work will be divided as follows: $50,000 for conduit, $50,000 for the McPhillips street sub-station and $50,000 for cables and wiring. Tenders will be called shortly. Smith, Kerry & Chace, engineers.

The following tenders were received for the erection of the terminal station in connection with the municipal power development [illegible] 531; J. McDairmid Company, $82,006.35; C. W. Sharp & Son, $113,735.15; Carter, Halls, Aldinger, $90,977.71; Engineer of Construction, $88,351.19; S. Brynjolsson, [illegible] J. H. Tremblay Company, $86,125.46; Clay[illegible]

AWARDED.

Midland, Ont.

[illegible]

St. Johns, Que.

M. Rubenstein, electrical contractor, Montreal, has been awarded the contract for the installation of an electric lighting system in the Government custom house at this place. The wiring will be installed in iron armor conduit and standard government fixtures are specified.

Toronto, Ont.

The contract for the supply of core cable for the electric power plant was awarded by the council to the Canadian-British Insulated, Limited, Montreal, $48,024.50. The next lowest tender was $48,188.85.

Miscellaneous

Bloomfield, Ont.

A by law has been carred by the ratepayers to issue $3,000 road improvement debentures.

Hamilton, Ont.

W. H. Cooper has a building permit for the brick addition being built to the grey room of the International Harvester Works. The following additional permits were issued: F. S. Depew, five brick houses on Case street, between Lottridge and Emily streets, $5,500.

Montreal, Que.

Recent building permits include: W. H. Dwyer Co., Ltd., 302 Board of Trade Building, alterations to warehouse, cost $5,000; Jos. Pelson, 522 Chabot street, three houses containing six dwellings, cost $3,500; Wilfrid Bessette, 97 St. James street, flats containing twelve dwellings, cost $20,000; Beckham & Scott, Montreal, house, cost $2,000; J. A. Nantel, 1157 St. Antoine street, house containing three dwellings, cost $2,000; Antoine Viens, 1076 Rachel street, one dwelling, cost $3,000; H. Deschamps, 182 St. Ferdinand street, house containing two dwellings, cost $2,000; T. Verbanise, 1101 Huntley street, house containing four dwellings, cost $2,300; H. Dubuc, 762 Logan street, two houses containing six dwellings, cost $10,000; Geo. Rattlelade, 276 Marquette street, house containing three dwellings, cost $3,000; Pauze & Cote, 218 Amherst street, two houses containing four dwellings, cost $12,000; Mrs. Robt. Allan, 300 Atwater ave., house containing four dwellings, soct $3,200; Beardmore & Co., city, warehouse, cost $36,000; A. Comiere, 533 Laurier ave., warehouse, cost $2,200.

Ottawa, Ont.

Tenders addressed to L. K. Jones, Secretary, Department of Railways and Canals, will be received until March 17th for the supply and delivery of timber and plank required for use on the Rideau canal for the year 1910-1911.

Oak Bay, B.C.

enders for sand and gravel were received from the following: Lineham Sand & Gravel Company, sand, per cubic yard, $1.08; gravel $1.25; filing, 88 cents in the northern or central districts; 98 cents in the southern district; $1.08 in Victoria West or 94 cents delivered to any point within the city limits. B. C. Sand & Gravel, $1.40; sand, $1.20 per cubic yard. James Richards, sand $1,20 per yard; gravel, $1.35 per yard. John Hagerty & Company, fillng, $1.15 per yard in the southern district; $1.10 northern district; $1.15 in the western district. Contract not awarded.

St. Thomas, Ont.

Tenders addressed to S. O. Perry, city treasurer, will be received until March 31st for the purchase of the following debentures: $42,000 Hydro-Electric, 30-year, 4 1-2 per cent; $5,752.08 local mprovement, 20-year, 4 1-2 per cent.; $11,652.81, local improvement, 10-year, 5 per cent.

Toronto, Ont.

The Erindale Power Company sustained a loss of $1,200 last week by an unexpected flow of ice.

Tenders addressed to C. W. Postlethwaite, harbor master, 508 Board of Trade, Toronto, will be received until March 30th for the dredging required in the harbor. Specifications at the office of the above mentioned.

Recent building permits include: G. H. Hager, 2 sty. & attic brick dwelling, Indian road, $4,000; L. S. Haynes, 1 pr. semi-det. 2 sty. brick dwellings, near Pape, Guelph avenue, $4,000; W. H. Plant, 2 1-2 sty. brick dwelling, near Highland, Roxboro, $5,000; S. Thomas, 1 pr. semi-det. 2 sty. brick dwellings, near Dundas, Sheridan, $4,000; W. E. Blake & Son, 3 sty. brick addn. to warehouse, near Queen on Church, $3,500; A. W. Reid, 5 det. 2 sty. brick dwellings, near Wells, on Albany, $15,000; G. W. Dale, 1 pr. semi-det. 2 sty. brick dwellings near Hogarth, on Logan, $4,500; W. H. Sparrow, 2 sty. brick addn. to store, 355 Yonge street, $3,500; L. Le Grow, 1 pr. semi-det. 2 sty. brick dwellings, near Harbord, Montrose avenue, $4,000; Watt Milling Company, alt. to planing mill, N.E. cor. Osler & Norman, $3,000; W. Hodgkinson, 4 att. 2 sty. R. C dw., brick fronts, near First, on Tiverton, $7,000; J. Lavall, 6 det. 2 sty. brick dwellings, near Withrow, on Logan ave., $12,000; H. L. Hudson, 2 1-2 sty. brick dwelling, near Indian road, on Westminster, $3,000; J. M. Walker, 1 pr. semi-det. 2 sty. brick dwellings, cor. Fern & Sunnyside, $4,500; K. J. Dunstan, 2 sty. & attic brick dweling, near St. Clair, on Russell Hill road, $8,000; S. Frame, 2 att. 2 sty. & attic brick stores & dwellings, 682-4 College street, $6,000; T. Kernick, 2 sty. brick dwelling, on 56 Hambly ave., $3,500; G. Wilkie, 2 sty. brick dwelling, near Heath street, on E. S. Russell Hill road, $6,800; T. Wilkins, 2 sty. & attic brick dwelling, near Sherbourne on Elm ave., $9,500; W. Weller, 3 sty. brick store & dwelling, near Delaware, on Bloor W., $3,500; P. M. Cooper, 2 sty. & attic brick dwelling, on 22 Beatty avenue, $3,500; W. G. MacKendrick, 2 sty. brick dwelling, near Rosedale Ravine Drive, on Roxborough street E., $6,500; G. W. Watson, 2 sty. & attic brick dwellings, on 2 Fern avenue, $3,500; C. E. Walton, 2 det. 2 1-2 sty. brick dwellings, on 993-995 Gerrard St. E., $3,600; Fisher Bros., 2 sty. & attic brick dwelling, on Sunnyside ave., $3,000; H. Wright, 2 pr. 2 1-2 sty. brick dwellings near Roncesvalles, on S. S. Marmaduke, $10,000.

Vancouver, B.C.

Tenders addressed to Wm. McQueen, city clerk, will be received until April 21st for the following automobile fire apparatus: 2 hose wagons, 2 chemical and 1 aerial ladder. Specifications, etc., at fire department.

Tenders will be received by Wm. McQueen, city clerk, until March 22nd, for two motor wagons and one sprinkling attachment for the garbage collection. Information from City Engineer.

A permit has been issued to Mason & McLeod, corner of Thurlow and Pendrill streets, apartment house, $80,000. Other permits include:—Mr. George King, covering a three storey block at 223 Harris street, $25,000; H. McLennan, 1530 Barnard street, $2,300; J. Crowe, warehouse, Front street, $8,000; L. S. Burton, 1935 Tenth avenue west, $3,000; ee, Lee Wo Co., Pender street east, $19,000; G. R. Baird, 2196 Second avenue west $12,500; M. Godson, 36 Hastings west, $3,000; M. Noble, 3005 Heather street, $6,000; Mr. C. J. Church for a frame apartment house at 2036 York street, $18,000; H. Hoffmeister, covering a two storey warehouse at 1290 Howe street, $9,000; J. Brown, 1190 Eleventh avenue west, $8,500; A. M. Coleman, Tenth avenue, $3,000; R. J. Coleman, Dock street, four houses, $6,000.

Winnipeg, Man.

The following building permits have been issued: A. J. Greeves, apartment block, east side Sherbrooke, between Buell and Preston, cost $15,000; J. Dixon, house, west side Arlington, etweben Livinia and St. Paul, cost $3,000; J. F. Parker, house, west side Lipton, etween Portabge and Livinia, cost $5,000; Aberdeen, between Powers and Andrews, H. Glesby, stable, $6,000; McDermott, between King and Princess, J. C. Wilson, steel water tomer, $2,500; Alexander, between Main and King, Real Estate & Investment Co., stores, $8,500; Vaudruil, between Bird's Hill and railway track, J. Ginpel, dwelling, $2,000; Rathgar, between Pembina street, northwest corner Lewis and Edwards, dwelling, $7,000; Jarvis, southwest corner of Salter, Chechik, Gold and Kernechan, cold storage, $20,000; Rosedale, between Nassau and John, Henderson Bros., dwelling, $1,800; McAdam, corner of Main, E. E. E. Bray, dwelling, $2,000; Polson, between McGregor and Power, R. A. Scott, dwelling, $12,500; Mulvey, south side Helen and Ainsly, J. Johnson, six dwellings, each $2,800; Paulin-Chambers, addition to factory, north side Ross between Princess and Paulin, $30,000.

AWARDED.

Dundas, Ont.

The American Road Machine Company, of Canada, Limited, Goderich, have been awarded the contract from Messrs. Doolittle & Wilcox, to furnish all the screens to be used in connection with a large crusher with capacity in the neighborhood of 6,000 tons per day.

Kingston, Ont.

The City Council has awarded to the Waterous Engine Company, of Brantford, Ont., the contract for steam engine of 600 gallons capacity for $5,000.

Port Arthur, Ont.

The Canadian Stewart Company has secured a contract for building a big dry dock. Estimated expenditure, $1,000,000.

New Companies

J. W. Kilgour & Bros., Limited, Beauharnois, Que., capital $300,000, incorporated to carry on a lumber and timber business. Incorporators, John Wilson Kilgour, and James Wilson, both of Beauharnois, Que.

United Manufacturing Company, Montreal, Que., incorporated to carry on the business of manufacturers of electricity for light, heat and motive power, etc., capital, $45,000. Incorporators, E. E. Vipond and H. S. Vipond, advocates, both of Montreal, Que.

National Bag & Paper Company, Limited, Ottawa, Ont., incorporated, capital, $200,000. Incorporators, W. Anderson, J. F. Booth, lumberman; W. H. Dwyer, merchant, all of Ottawa.

Quebec, New Brunswick Pulp, Lumber & Lands Company, Saint Antoine Abbe, Que., incorporated, capital, $20,000. Incorporators, Francois Toupin, contractor; Rev. J. Brady, priest, both of Montreal, Que.

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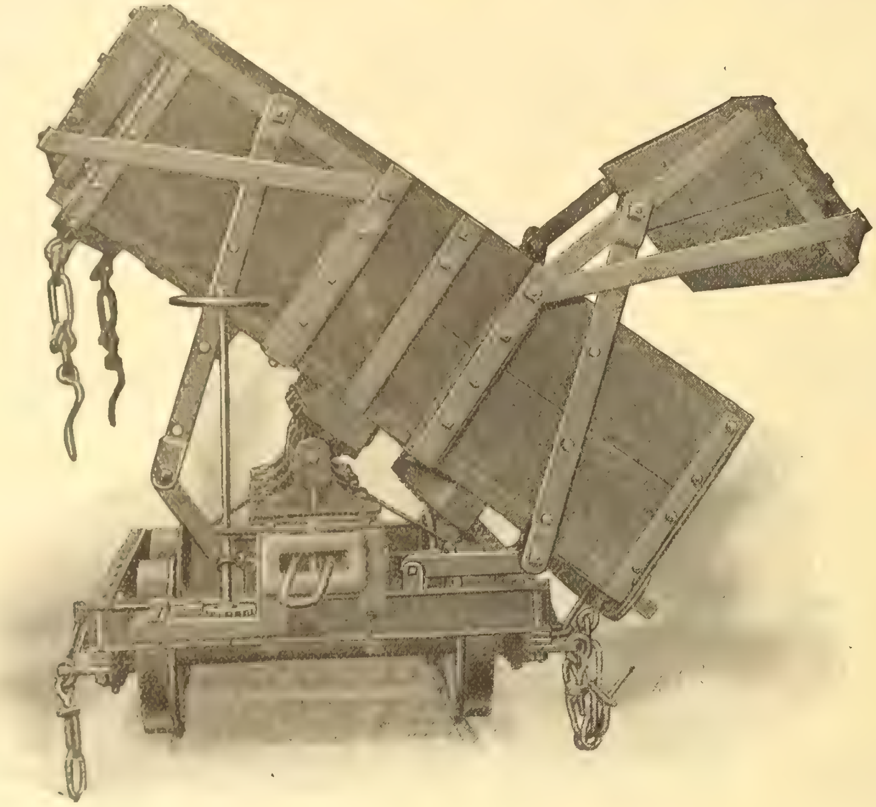

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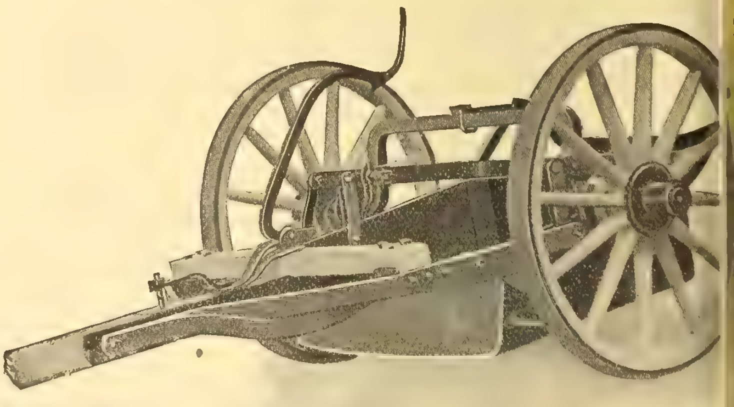

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lowing are offered for immediate sale at reduced prices. Quotations will be forwarded promptly on application :

5—45 ton Bucyrus Steam Shovel, 1½ yard dipper, in good condition; very low price.

4—No 1 Smith Concrete Mixer, mounted on truck with gasoline engine, good condition.

4—No. 1 Smith Concrete Mixer, mounted on skids with engine. Practically new machine. Has new drum and new gears. Engine thoroughly overhauled. New boiler and wheels could be attached, if desired, to suit buyer.

9—35 ton Vulcan Steam Shovel (new) 1¼ yard dipper.

3—No. 4 Austin Jaw Crusher, mounted on heavy wheels for portable work. Practically a new machine.

2—New Battery Wire Screen, 40 ft. x 17 in. No. 60 mesh.

0—25 H. P. Vertical Boiler fair condition, low price.

9—2 Selfrighting, Self Locking, Concrete Buckets, 1 yard capacity.

1—Stiff Leg Derrick, 50 ft. boom with bull wheel and swinger, blocks and complete fittings.

3—Large Plate Shear, No. 31

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2 12 inch Single Wire Rope Block with Shackles.

1 10 inch Single Wire Rope Block with Hook.

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No. 729—Centrifugal Drier.—Centrifugal Drier, copper basket, phosphor bronze foot and bearings. Capacity about three tons per hour, 850 R. P. M. Countershaft brackets and pulleys included, all in perfect order. Brake only missing.

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No. 843—Battery Wire Screen.—1 Roll 50 mesh Battery Wire Screening 18 in. wide x 10 feet long.

No. 844—Twist Drills.—Standard Tool Coy's straight shank twist drills, 9/16 in. to 1 1-4 in.

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2—5/8 in.	42c	"	"
1—3/4 in.	50c	"	"
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2—1 in.	90c	"	"
1—1-1/8 in.	$1.14	"	"
1-1/4 in.	$1.35	"	"

Lot of samples conveying machinery and elevator buckets.

Lot of dump car irons.

20 Axles 21 in. long.

Lot of Emery wheels.

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Dominion Exp. Co.,
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Erindale Power Co.,
West Toronto.

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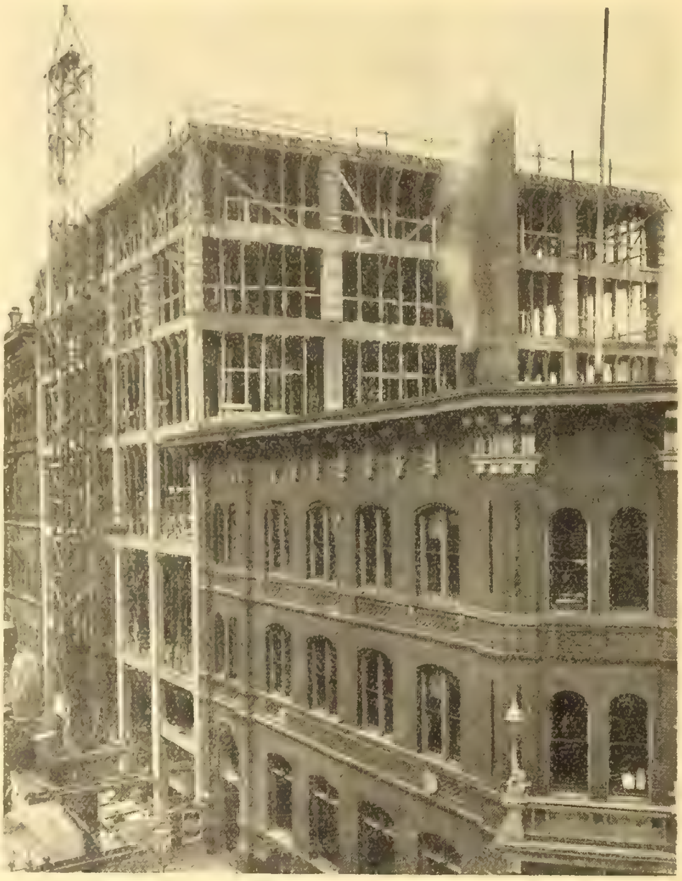
Co., Kemptville, Ont.



Some Users:

Joseph Vincent,
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Robert Simpson Co.,
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Murray Shoe Co.,
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Cut shows Reinforced Concrete Building under construction for the Thomas C. Watkins Departmental Store, Hamilton.

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ESTABLISHED 1886

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Vol. 24 Toronto March 16, 1910 No. 11

The Outlook for Business

It seems to be the consensus of opinion that the coming season will be a banner one for contractors. Last year at this time the prospects were considered pretty good, and ultimate developments proved that they were so, but a much better forecast is warranted for the coming season. There is promise of activity in every branch of building and engineering work. There are a great many important projects which have not yet been given out but which are progressing rapidly through the preliminary stage with every prospect of completion as planned. Again, many projects, plans for which were held over during the time of depression are materializing, and this speaks well for a boom in the contracting line.

In the country sections, as well as in the cities, the volume of building planned shows up remarkably well. Here, educational institutions and churches are likely to form a good percentage of the season's totals, while in the towns and cities perhaps the greatest activity will be experienced in business buildings and factories, recent reports from many sources favoring a substantial increase in these structures both in number and value.

In some quarters, as is always the case at this time of the year, there is some anxiety as to how the labor question is going to work out. It is almost certain that there will be demands for increased scale of wages, but there is an old saw about not attempting to cross a bridge before you come to it, and it is rather early in the season to be making predictions as to labor. If any trouble is developed it will probably come from a scarcity of help in the building field. In the west, especially, there is likely to be a premium on skilled mechanics. According to a recent report from Brandon, for instance, there are less than 25 bricklayers available in that city, with an increasing demand and no near prospect of improvement. Under such conditions it is only to be expected that higher wages will be demanded. Anticipating trouble from any source, however, has a depressing effect upon the trade, and at this time, in particular, every influence should be uplifting. If prospective work is discouraged through the uncertanties which may exist as to its progress should it be started, the outcome is almost certain to be that some work will be deferred and other work not taken up this season at all.

Naturally, the supply men are expecting a busy season. In view of recent developments it is only reasonable to expect a further increased consumption in cement as the ways of using it continue to grow. Present indications favor an increased sale for brick and terra cotta work and it seems likely that the coming season will witness an improvement in common brick, while the demand for construction work in the various phases is well maintained.

With a busy season in prospect the well organized contractor will have all his equipment in readiness by this time. In the heavier lines of contracting this is particularly necessary. Much money has been sacrificed in this quarter owing to carelessness in this regard. Repairs made on the scene of operations are never of such a satisfactory nature as those undertaken during the winter months, which provide the proper opportunity for overhauling old working equipment.

Unfair to the Contractor

One not infrequently hears complaints from contractors as to the unassailable position in which the engineer is placed by contract provisos. A recent kick of this nature is registered in a despatch from London, Eng., which runs as follows:

"George Sutton, managing director of the W. T. Henley Telegraph Works, at the annual meeting, said that the only fly in the ointment in regard to Canada is that a great deal of business is lost to British manufacturers because they are unable to accept the conditions which are creeping into municipal contracts.

"He said he had particular objection to conditions of contracts fixed by Canada. One of them was a clause in which they would put the company's reputation as contractors, and their contract money, entirely at the disposal of the engineer who was supervising the contract."

"If a man can preach a better sermon, write a better book, or make a better mousetrap than his neighbor, though he build his house in the woods, the world will make a beaten path to his door." —Emerson.

New Methods in Reinforced Concrete Work

Detailing a System of Construction for Light Floor Loads Interesting Practical Data and Comparative Costs

By Emile G. Perrot

While there has been no doubt of the economy and practicability of reinforced concrete for massive construction and where heavy loads are carried, the advisability of its use for light floor loads, especially if the spans are long, has been questioned even by those who favor its use in other instances. The dead weight of the material itself has often operated against its use, especially where the carrying capacity of the soil required the unit pressure to be kept to the minimum, or from other like causes.

We all agree that clear spans of 40 or 50 ft. in buildings are not usual and are generally avoided on account of their increased cost; hence a description of such a span, with its cost as compared with steel girder construction for the same span, is of interest.

While the author does not wish to take any credit for originality in the design of this floor, as the same general scheme has been used many times before for shorter spans, it is because of the unusual length of the span that its details become an important factor in the design.

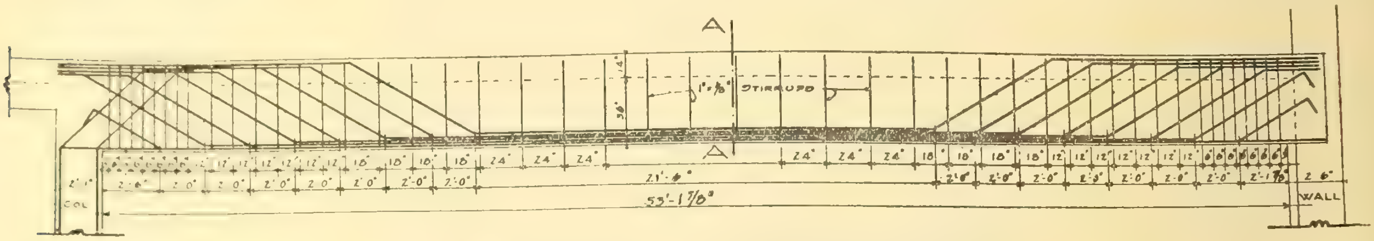

Fig 1 Longitudinal Section of Long Span Girder

The spans in question form the floors over the swimming pool and gymnasium of the Turngemeinde Club House, Philadelphia, and are 53 ft. 1⅞ ins. clear span. There are two floors with these spans, of an area of about 4,700 sq. ft. each, having five girders on the first floor and six on the second floor, spaced 13 ft. 9 in. centers. Those of the first floor are only 36 ins. deep below the joist, on account of head room. The top portion or T-head is 5 ft. 4 ins. wide and 14 ins. thick. These girders are reinforced with twenty-one 1⅛ in. square twisted bars, bent as shown by Fig. 1. The stirrups are 1x⅛ in. flat iron, bent and spaced as shown by Fig. 2. Great care was taken to place the bars accurately in position, and the bottom bars were supported in the bottom of the molds on cast cement chairs, while the spacing of the bars and stirrup was maintained by iron rods and the wiring of one bar to the other.

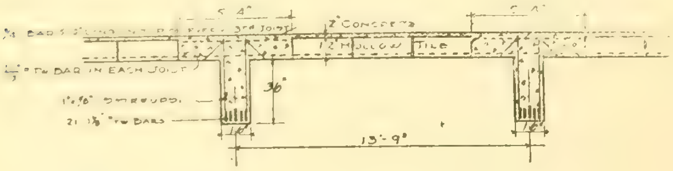

Fig. 2—Transverse Section of Long Span Girder

The floor panels between the girders consist of 5x12 in. concrete joists, with a 2-in. reinforced concrete slab over same, and 12x12 in. plaster block centers between each joist, thus making a flat ceiling between girders. The joists are reinforced with one 11-16 in. square twisted bars and eight ¼ in. stirrups. In the top of every third joist were placed two ¾ in. square twisted bars over the girders to act as tie. These rods were only 5 ft. long, but two were used in each case, lapped in the center so as to project beyond the T-head into the joists. The slab is reinforced with ¼ in. rods run in both directions, 12 in. on centers or thereabouts.

The girders supporting the auditorium floor, on account of the higher ceiling, are 43 ins. deep, with T-head, 4 ft. 9 ins. wide. The reinforcement in the bottom consists of eighteen 1⅛ in. square twisted bars, bent the same as shown for first floor.

Each floor is designed for a live load of 120 lbs. sq. ft., as the top floor is an auditorium and the floor below a gymnasium.

There seemed to be some doubt amongst the members of the building committee as to the advisability of constructing such a long span of reinforced concrete, and one of the committee went so far as to offer to increase his subscription to the building fund by a very large amount, in order to pay for steel girders, but the amount offered was insufficient to pay the extra cost, so the girders were built as originally designed, of reinforced concrete. In order to obtain the actual difference in cost, we designed the girders of Bethlehem steel girder sections, reinforced with top and bottom cover plates and fireproofed. The size of the steel girders was 30 ins. deep, 200 lbs. per foot, with two cover plates on each flange, one ⅝x15 ins. and one ½x15 ins. We obtained bids from the building contractor for the difference in cost of these girders, we having likewise made an estimate of the difference in cost. The contractor's price for them was $6,500 additional to his contract price, although our estimate of the difference was somewhat less, being $4,664, based on prices obtained from outside sources. Taking our figures as a base, as there are 5,400 sq. ft. in the two floors, the difference in cost for the structural steel, fireproofed, is 50 cents a square foot more than the reinforced concrete, with no increased advantage.

The weight of the structural steel for a girder as compared to the weight of reinforcing steel is as follows: Total weight of steel girders, with strap iron reinforcement for fireproofing and bearing plate, about 17,000 lbs. Total weight of reinforcing steel in one reinforced concrete girder, 36 ins. deep, 5,500 lbs.

This shows that it takes about one-third the amount

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*Read at the annual convention of the National Association of Cement Users February, 1910.

of steel for reinforced concrete as compared with structural steel for girders and beams. The amount of saving in concrete would be the overhanging portions of the T-head, which amounts to 2¼ cu. yd. per beam, when the extra thickness of concrete on the girders is taken into account due to the wide flanges on the steel girders; likewise there would be additional plaster blocks necessary to take the place of the T-head omitted, the cost of which would have to be deducted from the saving effected by omitting the T-head.

The sub-contractor for the reinforced concrete work gave the cost of the plaster blocks delivered at the job, as 14 cts. per sq. ft., and setting of same, including the nailing on of a fine wire screen at each end to prevent the concrete running into the hollow part of the block, as 3 cents per square foot additional.

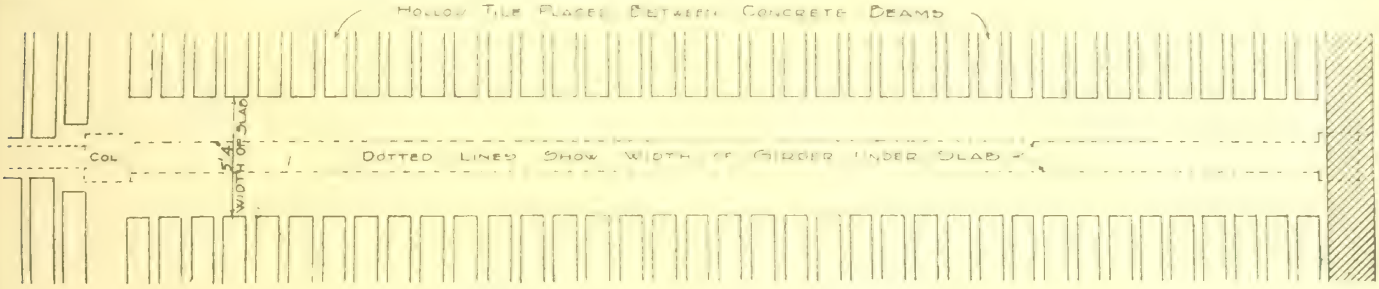
Hollow Tile Placed Between Concrete Beams
Col
Dotted Lines Show Width of Girder Under Slab
5'4" Width of Slab

Fig. 3—Plan of Long Span Floor Construction

The plaster block weighs 25 lbs. per sq. ft., as compared with 40 lbs. per sq. ft. for terra cotta tile, which costs the same price as the plaster block, but which are not as easily handled, being only 12 ins. long, whereas the plaster blocks are 3 feet long and can be sawed to fit any position.

The walls of plaster blocks are about 1½ ins. thick, and there are two cells in each block, separated by a vertical wall in the middle which strengthens the block, so that traffic can take place over them and during the time of pouring the concrete.

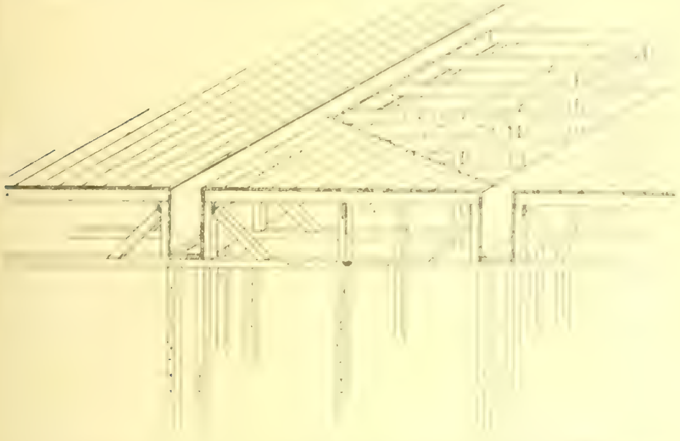

Fig. 4—Form for Constructing Long Span Girder

Immediately before pouring the concrete, it is necessary to thoroughly soak with water the plaster blocks, as they absorb a considerable quantity of water from the concrete if not thoroughly wetted; in fact, the parts of the floor where the blocks are wet and where they do not, are clearly marked during the earlier stages of the setting of the concrete by the difference in its color, the concrete which [illegible] in contact with the plaster requiring more time to set.

For moderate spans [illegible] either the plaster block or tile filler are desirable, where a flat ceiling is sought and the load light.

Canadian Society of Civil Engineers

At a general meeting of the Canadian Society of Civil Engineers, held in Montreal last week, the Gzowski silver medal was awarded to Professor Brown, McGill University, Montreal, for his paper on "Reinforced Concrete Beams," read last season. The presentation was made by the chairman, Mr. W. F. Tye, vice-president of the society.

This ceremony ended, an address on "The Conservation Problem in Canada" was given by Mr. C. R. Coutlee, of Ottawa, engineer in charge of the Ottawa storage system. In dealing with this, and the water supply of the country, Mr. Coutlee pointed out the enormous cost of the canal system to Canada, and the great expense of canal transportation as compared with railways, showing that instead of being 30 cents per ton mile it really amounted to $3.30 per ton mile when the cost of construction and maintenance was considered.

From this Mr. Coutlee proceeded to a description of the immense works now under way by the Government for the conservation of the head waters of the Ottawa river, so as to regulate its flow and give a full supply of water for power purposes all the year round. The Ottawa river, he pointed out, drained a territory of 55,000 square miles, equal to all England and Wales, and during half a century its flow had averaged 55,000 cubic feet a second, varying from 10,000 feet at low water to 150,000 and even more during flood time. The result of these great variations was that while at times there was more water than power plants could handle, during much of the year there was not enough.

In order to overcome this the Government had decided to construct great reservoirs in the wild northern country, in whose lakes the supply of water for the river was collected. To this end immense dams were being constructed, which would raise the level of Lakes Temiskaming, Kipawa and other lakes twenty feet, giving a storage of 300 square miles twenty feet thick. This could be controlled so as to equalize the flow of the river and double its horsepower at low water, raising it at the Chandiere Falls from 25,000 to 50,000 horsepower. This work, which would only cost $500,000, would ultimately render available some 200,000 horsepower, which could be sold to companies, and doubtless would in time find a market, when methods were devised for economically [illegible] miles.

A joint meeting of all the carpenters' unions of Toronto has been called by the Amalgamated Society of Carpenters and Joiners and the Brotherhood of Carpenters, to take place on March 19th, to consider the question of [illegible] the offer of the Master Builders to raise the wages of carpenters from 33 to [illegible] hour.

Street Improvement in Towns and Villages

Classification, Drainage and Design of Streets—The Choice of a Higher Grade Paving Material—Management and Cost

By W. A. McLean, Provincial Engineer of Highways for Ontario.

Of all works of improvement, the streets of cities and towns call for most general attention. There is no work which, for the expenditure, will make better returns in advanced property values. The public streets constitute a system of parkways which every town possesses. There is absolutely no excuse for the state of disorder in which they are so often left.

Street improvement does not necessarily imply their complete construction with expensive roadways and pavements. The smallest village can have its streets graded, drained and kept clean and neat at so low a cost that neglect is inexcusable, except on the ground that the means of so doing are not generally known and understood. There are two phases of street work—the one implying little more than neatness, the result of good grading and draining with subsequent care; the other reaching into the construction of pavements of a more or less expensive type.

The complexity of municipal services is nearly as great for a town as for a city. The city requires large works, but there is proportionately a greater amount to spend upon them. Towns require waterworks, sewers, sewage disposal, well-designed streets, but they have to be obtained for a less expenditure—and the greater economy very often demands proportionately greater skill. The planning of a town in all these respects should, as far as practicable, be undertaken as one work—not a series of disconnected sections. Just as a house is now planned with water service, waste-pipes, sewer connections and electric wiring, considered in connecton with foundations, walls and partitions, so the more nearly a town's services can be dovetailed into the one system, will there be less future expense when these are installed. The tearing up of pavements to lay sewers, water and gas mains is one of the chief results of unsystematic methods.

Classification of Streets.

Streets of a small town naturally fall into several classes as regards paving. There is the immediate business section, with roadway from sidewalk to sidewalk, where the best pavement the town can afford should be laid. For this we may have a well-built broken stone roadway; or preferably may look to the higher class of pavement, such as vitrified brick, asphalt block or concrete. For main thoroughfares, entering a town with farm traffic, a well-built macadam roadway is a standard. Other streets, of still less importance, should at least be graded and drained, looking to an ultimate coating with gravel or broken stone.

Drainage of Streets

Before considering further the details of street design it should be emphasized that good drainage is essential for any class of improved street. Good drainage is the first principle of road building of any kind. A clear understanding of drainage and its influence on roads and pavements is essential to a skilful handling of this work. For this reason the improvement of streets can hardly be considered apart from sewers. To pave streets and then to tear them up, to lay sewers, is wasteful in method; but sewers are necessary for the efficient handling of storm water. The town with a good system of sewers has taken a valuable step towards modern street improvement as a means of outlets for drainage. Drainage should provide both for surface and subsoil water. That is, there should be gutters or open drians, with outlets, to carry away storm-water and drainage from the roofs of houses; but further, by means of pourous tile drains, the waterline should be kept at least two feet below the grade of the roadway. If a village or street does not require an effective sewer system, the porous tile drains may be employed both for storm and subsoil drainage.

Design of Streets.

By means of underground drainage, the streets or towns may depart from the general plan of country roads, in which large open drains and a high grade are so often necessary to provide a bed of dry soil under the metal surface. This is the distinguishing feature of town streets, that by a complete system of sewers and underdrains, the grade may be lowered, and shallow gutters take the place of open drains.

In the design of a town street in the business section the roadway should be paved from sidewalk to sidewalk. The usual width of streets in Ontario is 66 feet. This provides for a roadway 40 or 42 feet wide, and walks on each side twelve or thirteen feet in width. This is the plan of Yonge Street, Toronto, and is generally followed throughout the province.

For residential streets—or any street not in the business section—a design which meets with a great deal of favor consists of a roadway 24 feet wide, bordered on each side by a 6-inch concrete curb. Between the curb and the walk is a strip of sod about 6 feet wide; then the sidewalk 5 feet wide; then the remainder of the allowance (9 feet 6 inches on a 66-foot street) is sodded and in appearance added to the depth of the lawn. When streets have been graded and boulevarded in this way, the usual effect is to cause the owners of private property to remove fences, improve their lawns, plant flowers, and get busy with the paint pot. Many residence streets in towns and cities are only 18 or 20 feet from curb to curb, and traffic is not inconvenienced. With a narrow roadway the cost of construction is less, maintenance is less, and the appearance of a street is improved by the wide boulevards.

Every care should be taken to get the grade of a street right. This is the distinguishing point between a town street and a country road. The crown of the roadway should be no higher than is necessary—usually no higher, preferably lower, than the sidewalk of the curb. To anyone driving along a street of the high country road type, the houses look low and "squatty," and the appearance of the street is in every way inferior.

The building of a town street then involves considerable excavation, which can usually be placed in the boulevard or in adjacent low-lying lots. The shorter the haul the less the expense. Having graded the street, the earth roadbed should be tile drained—thoroughly rolled, and it is then ready for the pavement.

For a macadam road, crushed stone of the best kind obtainable in the locality will ordinarily be used. Field stone or quarry limestone are most common in Western Ontario, while in the east, granite, gneiss and trap may be had. Crushed and screened gravel may be used. Natural pit gravel may be laid for a foundation, and over this may be spread a wearing surface of crushed stone. Or a foundation of large flake stone, laid by hand and rolled, gives good service. The depth of consolidated material should be, on town streets, eight to ten inches, on residence streets it may be spread to a uniform depth curb to curb, or may decrease in thickness toward the curb, according to the requirements of traffic. Whatever material is used, it should be thoroughly consolidated by rolling. A roller is an absolute necessity in making an economical and durable roadway for either town or country traffic.

Higher Class of Pavements.

Coming to the higher grade of pavement for a central business section, the small town is debarred from the use of sheet asphalt owing to the expensive plant needed for construction and repair. Choice will necessarily be made between vitrified brick, asphalt blocks, westrumite, concrete, or a high class macadam. Apart from macadam, the pavements are practically the same up to the surface covering. That is, they all require the same concrete foundation, 5 or 6 inches in thickness, and the same concrete curb and gutters. In order of first cost, prices have ranged, with concrete as cheapest; then westrumite, vitrified brick and asphalt block. No one of these pavements can be said to be superior to the other in every respect. Whatever pavement is selected, the chief point is to see that only first class material is accepted, that the concrete foundation is good, and that workmanship in laying is what it should be.

Samples of concrete pavement may be seen in Windsor, Chatham, and to some extent in Toronto. Asphalt block may be examined in Windsor, Seaforth, Stratford, St. Catharines, Guelph or Toronto; and vitrified brick is largely used in Toronto, and may be seen in St. Thomas, Guelph, Chatham or Petrolia. Westrumite is a comparatively new asphaltic pavement in Canada and may be seen in Brantford or Guelph. Bitulithic is a pavement with a refined tar base, and is used in a number of cities, Toronto, Chatham, London and elsewhere, but like sheet asphalt requires an expensive plant and skilled labor to construct and repair, so that it is not adapted to small towns. Good samples of ordinary macadam may be seen in Toronto, Galt, St. Thomas, Kingston, Belleville, Ottawa, and other towns and cities. No attempt is made in any case to give a complete list of the places in which any of these pavements are used. Councils having matters of street improvement before them should visit a number of these places in order that different methods and materials may be compared and the most suitable adopted.

Curbing and Gutters.

Concrete curbing is growing in popularity as a means of narrowing roadways and protecting the boulevards. It may be used on an earth roadway or any class of street. Combined with a concrete gutter, they are a necessity on any of the higher class of pavements. The cost of curbing, as with everything else, varies, but is usually about 25 or 30 cents per lineal foot, with 40 or 50 cents per lineal foot for concrete curb and gutter.

Management and Cost.

No hard and fast price can be stated for any class of roadway or pavement. Local conditions as to labor and material are the ruling factors. The system of management in any case may double the cost or reduce it materially.

To get results that will be satisfactory, every town undertaking street improvement should employ an engineer. If there is not a local man, then one who has made a success of this work in his own town. It is the work of the engineer to map out the drainage, give grades, prepare specifications, and in general give such expert attention as will produce uniform results. The patch work that so many towns in Ontario have been carrying on to save an engineer's fee is simply deplorable. To save $15 or $50 councils are easily losing from ten to one hundred times these amounts in results. Every town and village should at least have a definite plan of improvement mapped out under an engineer's advice so that each succeeding council can work on a uniform system from year to year, such as will in a term of years accumulate into a complete improvement of the town.

Method and Cost of Road Surfacing With 2 in. Concrete Cubes

During the past year a new type of road surfacing was employed in the construction of a section of state highway in Monroe county, New York. This surfacing consisted of 2-in. concrete cubes made from Portland cement and gravel or shale and moulded in machines specially built for the purpose. The idea of using these cubes was evolved by Mr. J. Y. McClintock, county engineer of Monroe county, and the New York State Highway Commission authorized the expenditure of $2,250 for the purpose of making a preliminary demonstration. At the recent annual convention of the National Association of Cement Users, Mr. George C. Wright, consulting engineer, Rochester, N.Y., described the methods employed in constructing and laying these cubes, his information in the main being taken from a report of Mr. McClintock to the State Highway Commission.

The cubes were placed in a section of the Ridge Road northeast of the city of Rochester, N.Y. On this section the original trap rock surface 2 in. thick was completely off at the centre and nearly so at the side of the 16 ft. macadam roadway, leaving exposed a good solid lower course of rather large size broken Medina sand stone resting on good gravelly foundation.

The existing surface was somewhat rough and knobby, and over this was spread as thin a layer as possible of screened gravel, which was rolled down with a 12-ton roller, so that in spots it was 2 in. thick and in other spaces the over knobs it was no measurable thickness. The resulting surface had a crown of about 4 in. in 16 ft. width.

On this bed so prepared was placed directly a wearing coat of 2-inch cubes for a width of 15 ft., being laid close together by hand, the edges being held up temporarily by 2-in. planks laid lengthwise with the road. On the cubes was spread a small amount of fine, somewhat loamy, gravel, which was broomed in, after which the horse roller was slowly passed over the whole of the surface, forcing the cubes to take a full bearing on the supporting gravel. The edges and roller [illegible] was supported by the planks, when the side planks were pulled up and moved ahead and coarse gravel [illegible] in. to 12 in. was placed along the sides next to the cubes on the shoulder for a width of about 2 ft. Outside of this a finer gravel spread, feathered off to a width of about 3 ft., more of the fine loamy gravel was spread on the top and broomed and flushed in until the space between the cubes was thoroughly filled. The gravel on the shoulders was wet and the whole surface thoroughly rolled with the heavy roller.

A stretch of road 1,800 ft. long was surfaced with cubes. On 1,600 ft. Portland cement gravel concrete cubes were used, and on 200 ft. vitrified shale cubes 2¼-ins. in size were used. For a length of 100 ft. a coonerete sunken curb 6 ins. by 9 ins. in dimension was used in place of the gravel shoulders. On a 100 ft. length the joints between the cubes were fifilled with Portland cement grout instead of the fine loamy gravel. For 60 ft. on which the joints were filled with the fine gravel, light asphaltic road oil was sprinkled over.

A machine for making cubes which is an adaptation of the ordinary cement brick machine was furnished. This machine made 68 cubes at one operation, resting on a wooden tray, and the tray was carefully placed on a drying rack without disturbing the freshly made cubes. The cubes remained in racks 24 hours and were then dumped in a pile. This pile was thoroughly sprinkled twice each day.

The number of cubes made was about 7,000 upon the first day, but within a few days the same gang was able to make with ease 26,000 of the cubes. Various sizes of screens were tried from ½ in. to 2 in., but it was found that the ½-in. screen gave a product that could best be handled in the machine. Experience showed that the concrete had to be rather dry in order to avoid settling and bulging of the cubes before the concrete set. The amount of cement used averaged 2 2-10 bbls. to a cubic yard of concrete. The area covered with cement cubes was 2,652 sq. yds., upon which was laid all of the 730,000 cubes manufactured, except about 5,000 kept for repairs. The cost of cement cubes laid was as follows:

	Per sq. yd.
Cement, 0.088 barrels	$0.121
Cost of factory	0.107
Labor of manufacture	0.161
Gravel, 50c per cu. yd.	0.024
Carting	0.027
Laying	0.072
Total cost per sq. yd. laid	$0.512

There was placed on shoulders 219 cu. yds. of gravel covering 1,800 sq. yds., costing $2.12 per cubic yard rolled in place, or 26 cents per square yard.

In considering these figures as the basis for estimating cost it is obvious that there might be reductions made in cost of cement by using a reduced quantity, and in reduced cost of carting, the cost of the factory might be disturbed over many more square yards, and the cost of labor reduced by use of concrete mixer and other labor-saving devices. The cost of gravel in pit is usually nearer 10 cents per cu. yd. than 50 cents, which was paid here. The cost of laying was very much reduced as the men became experienced, and this could be still further reduced by paying for it on the basis of piece work.

At Prince Arthur, Sask., the building permits issued during 1909 represented a total value of $200,000, compared with $350,000 for 1908. As to prospects for the current year, Mr. F. A. Crighton, city clerk, writes: "Prospects are exceptionally bright. It is expected that the building of 1910 will exceed that of any other year in the history of the city."

Notable Cement Convention

Canadian Cement and Concrete Association Working Hard in the Interests of Great Meeting at London, Ont., March 29-April 1.

Widespread interest is being taken in the approaching convention and exhibition of the Canadian Cement and Concrete Association, which is to be held at London, Ont., March 29 to April 1. Among the many interesting subjects to be discussed at the convention is the formulating of standard specifications for cement and concrete work, with special reference to their adaptation to Canadian business and climatic conditions. The special committee of the executive, consisting of Messrs. Gustave Kahn, Professor Gillespie and R. E. G. Hagarty, will submit their report in this connection.

While the official programme of papers to be read has not yet been issued, contributions will probably be submitted in part as follows:

Opening Address—Professor Peter Gillespie, President Canadian Cement and Concrete Association.

"Concrete in Europe," Mr. Richard L. Humphrey, Director of United States Structural Materials Testing Laboratories, Philadelphia.

"Concrete Construction," Mr. Cecil B. Smith. of Messrs. Smith. Kerry & Chace. consulting engineers. Toronto.

"The Use of Cement in Architecture." Mr. F. S. Baker, President Royal Architectural Institute of Canada.

"The Engineer and the Finished Work," Mr. A. W. Campbell. Deputy Minister of Public Works, Ottawa.

Professor W. H. Day, Ontario Agricultural College, Guelph, Ont., subject probably "Cement Tiles."

Mr. Ernest Wilby, architect, Detroit, Mich., subject undecided.

"Municipal Concrete Bridges," Mr. A. W. Connor, of Messrs. Bowman & Connor, consulting engineers, Toronto.

Mr. Percy H. Wilson, Philadelphia, Pa., subject undecided.

"The Commercial Aspect of Reinforced Concrete in Canada," Mr. Gustave Kahn, of the Trussed Concrete Steel Co., Toronto.

"An Analysis of Concrete Bridge Failures,' Mr. C. R. Young, of Messrs. Barber & Young, consulting engineers, Toronto.

"Inexpensive Homes of Concrete," Mr. M. D. Morrill, architect, Washington, D.C.

"Concrete from the Contractor's Standpoint," Mr. D. C. Raymond, Vice-President Bishop Construction Co., Montreal and Toronto.

"Highway Bridge Construction," Mr. Charles Talbot, London, Ont.

Mr. A. G. Larson, Owen Sound, subject undecided, probably chemical.

"The Uses of Concrete on the Farm," Mr. Philip Wormeley, United States Department of Agriculture, Washington, D.C.

"Concrete Pavements," Mr. James Pearson, contractor, Toronto.

"Concrete Sidewalks," Mr. C. W. Boynton, Chief Inspecting Engineer, Universal Portland Cement Company.

"Waterproofing," Mr. R. A. Plumb, Detroit, Mich.

Exhibition of Cement Products, Etc.

The exhibition of cement products will be formally opened by His Worship the Mayor. This feature of the convention promises to be a great success. Space has already been allotted to a large number of the leading Canadian and United States concerns, and the Princess Rink, the use of which has been donated to the association by the city council of London, Ont., will contain many interesting exhibits illustrating processes of manufacture, products and machinery.

Mr. R. E. Hagarty, 662 Euclid Avenue, Toronto, the secretary of the association, will be pleased to furnish any further details to interested parties.

Cost Keeping on Railroad Construction

Advantages of Estimating by the aid of Systematically Prepared Records —A General Outline of Satisfactory Record and Cost Systems

By B. M. Laughead*

The method of keeping costs of railroad construction work by an engineering contracting firm is one of the most important features of the contracting business. I say "engineering contracting firm" because I believe that future successful contracting business is going to be carried on by contractors that are thoroughly trained engineers. The contractor that submits a bid for a few meagre calculations and then finally throws such calculations in the waste basket and makes a bid almost purely from guess work is destined to be sidetracked by the engineering contractor, who has made estimates of his work from systematically prepared records of cost keeping of actual work performed.

It is customary among some contractors, after having made a rough calculation of the cost of a certain piece of work, to look over their bid and say, "Well, I know this piece or section of work will be let for such and such a figure," and finally ignore all their calculations and resort to guess work. They are not willing to submit their bid as figured, for the simple reason that they know at the start their data, if any at all, are not reliable, and such being the case, a guess is better than risking their calculations on poor records of previous work. Not only is it necessary for the contractor to be able to bid successfully on contract work, but he should have such engineering training as will enable him correctly to calculate the contents of all kinds of excavation. He should be able to calculate the contents of all masonry structures, not roughly, but accurately, so that when the finals are returned he will know whether the engineer in charge of his work has submitted estimates that are correct.

Contractors Should Check the Engineer's Work.

The contractor should have records of all cross sections and should go over his work before the grading is begun and carefully examine the ground to see if the engineer has cross sectioned his work properly; that is, taken sections where they are needed and a sufficient number of them. It often happens that the engineer in charge of a piece of construction work is so busy, especially at the beginning of the work, that he does not have time to give his attention to the cross sectioning, but has to leave it to others who in some instances are really incompetent to do the work. The engineer never has time to examine the cross sections on the ground to see if they have been properly taken, and without such an examination neither he nor the contractor is aware of the fact that certain sections that affect very materially the contents of the excavations have been improperly taken, partly through ignorance and partly through carelessness.

The successful contractor should have as complete a record of all notes pertaining to the work as does the engineer in charge of the work. Taking a piece of railroad construction work or any construction work, let us see what notes on cost keeping and engineering records the contractor should keep, from beginning to end of his contract. One part of the contractor's office should be used for keeping and filing of all engineering records and cost data.

Let us take first the method of keeping the engineering records, as they are just as essential as the cost keeping and should be kept together. The first thing the contractor should do in carrying out his contract is to form an acquaintance with the engineer in direct charge of his work. He should tell the engineer of his plans in regard to cost keeping, stating that it will be necessary for him (the contractor) to have a copy of all cross sections, level and alignment notes. It is not likely that the engineer can furnish all the cross section notes at once, but they can be gotten as fast as the engineer takes them in the field. Let me say as a side remark that no honest engineer should hesitate to give the contractor a copy of his notes, for he should be only too glad to have a competent contractor check all his work. It should not take the engineer long to judge whether the contractor really is competent to handle engineering records and is really in earnest about his cost keeping. The engineer and contractor should at all times be on the best of terms, for an exchange of notes is of the greatest value to both.

The cross section notes should be copied by the contractor from the engineer's record in a regular book made for the purpose. A good form is published by Keuffel & Esser and numbered in their catalogue 380. If the engineer is slow in giving the cross section notes it is well for the contractor to copy the notes in a transit book, K. & E. No. 360, as fast as he can get them, and later copy all the notes consecutively in cross section book, K. & E., No. 380. These notes should be plotted on cross section paper and carefully used each month to work up monthly estimates. A planimeter is a very handy instrument and should be used by all contractors.

Before any grading work is started and in fact as fast as the engineer sets the slope stakes, good heavy stakes about 3 ft. long should be driven 1 ft. deep at each slope stake and the station number and cutting marked on same. The importance of this is obvious.

The contractor should plot a profile on heavy profile paper—plate B, 4x30 full width, so as to enable him to keep a careful record of each month's work, using a color for each month. The quantities of each month's work, both grading and masonry, should be printed on the profile in same color to show actual figures. This progress profile should never leave the office. The contractor should also plot a profile in profile book (a good form is published by the Engineering News Publishing Co.).

This profile book should be an exact copy of the office profile, although on a much smaller scale, and should be carried in the pocket at all times for reference. These profiles should contain all alignment and level notes, property lines, road and channel charges, masonry structures, clearing, etc. The contractor should have a private note book, preferably [illegible] and in it keep a daily record of the progress of the work, giving the actual condition of each piece of work. He should have on file a copy of all notes, such as the culverts, road and channel changes, masonry structures, sewerage, etc. He should have a tape, hand level and level rod and it would be well for him to have a transit and level combined.

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*Read at the January meeting of the American Society of Engineering Contractors.

Method of Cost Keeping.

Having given a general outline of the method of keeping the engineering records, we will now look to the method of cost keeping. The contractor's timekeeper should keep his daily time book in such shape as will enable him to transfer his notes to a special book, which also contains the monthly estimate, as taken by the contractor himself. The monthly estimate as given by the engineer in charge should not be used by the contractor in calculating his unit costs of the work, as very often they are too approximate and not reliable enough for a close approximate of the actual cost of the work.

The cost keeping record book should be so constructed as to enable the contractor to charge all labor against the quantities of estimate, with suitable columns for prorating fixed charges and expenses, of the entire contract against each particular piece of work.

After the contract is complete and the final estimate has been received and accepted by the contractor, he should prepare a final cost keeping record book, making all chargings of the different pieces of work against the final quantities as given in final estimate.

The object of the monthly cost records is to show the contractor the progress he is making and what this progress is costing him. His daily record book or diary gives him the conditions under which the different pieces of work were done and the two together are invaluable to him not only for his present but also for future work. The final cost keeping record book will principally be used in figuring on new contracts.

Road Building in Wentworth County, Ont.

How the Good Roads Scheme is Working Out—Interesting Facts and Figures Relating to Road Machinery Employed*

By James L. Taylor, Superintendent

I have had many enquiries from the representatives of different Counties in our Province as to the working of the Good Roads System in the County of Wentworth and the cost of the work of crushing stone and rolling, etc.

As the County of Wentworth has practically completed its system of good roads; no doubt there are some who would like to know just how the scheme has worked out. The few words that I have to say will be along the line of the cost of the work in general as a County system, and the cost to the individual ratepayers on each one thousand dollar assessment.

As an example, I will first take the work of 1909, as a whole, and show the cost of crushing the stone and putting it on the road, and also the cost of rolling on the road after being placed in position.

The County of Wentworth owns two road rollers, but we should have had more road rollers in order to do the work properly and get the best results for the money expended.

It is established beyond doubt that the road roller is the life of any macadam road. When the County of Wentworth first started on the good road work, we only had one road roller, and I found it impossible to roll properly all the stone that was being crushed and laid on the roads. Some of this work was thoroughly rolled, and some not more than half-rolled, and some did not get any rolling. The work that was thoroughly rolled stood the action of the hoof and wheel and is in good condition to-day. It also held its shape and form, while the portion that was only half rolled showed signs of weakness and lost its form and shape. Ruts were a prominent feature in the road, holding the water and assisting to wear the road out.

Last year I made an extra effort to get our rolling all thoroughly done with two road rollers, by running night work as much as possible. The Waterous roller last year ran for 202 days of ten hours each, and 76 nights of twelve hours each, and cost $189 for repairs. (This is practically all the cost for repairs this roller has incurred since it was bought, and it has run for five seasons; it was purchased in 1905).

The J. I. Case roller was in operation 129 days of ten hours each and eikhteen nights of twelve hours each, and cost for repairs $197. (This roller has been in operation four seasons and was purchased in 1906).

The County of Wentworth owns and operates four stonecrushers, two of the Sawyer-Massey make, and two of the Climax crushers.

1st. Climax crusher, No. 2. worked 134 days and crushed 1880 cords, an average of 14,029 cords per day; 2nd. Climax crusher No. 2., worked 127 days, and crushed 1705 cords, an average of 13.425 cords per day; 1st. Sawyer-Massey crusher worked 132 days and crushed 1386 cords, an average of 10,500 cords per day; 2nd Sawyer-Massey crusher, worked 126 days and crushed 1362 cords, an average of 10.80 cords per day; making a total of 519 days to crush 6,333 cords, or 12.009 cords, the average amount crushed by each crusher per day. The average amount of the stone crushed by the four crushers combined for the season was 48 cords per day.

The cost of quarrying, crushing and delivering the stone on the road for the year 1909, was $4.96 per cord, made up as per the following example.

The total amount expended on roads for wages and teams as per foreman's time books for the year ending December 31st, 1909, was $33,941.18. made up as follows:

Amount expended for winter work, repairs to machinery, culverts and grading, etc.	$ 1,468.32
Amount for new culverts	1,211.14
Rolling expenses for the year, including engineer and team	2,054.00
Amount expended for quarrying, crushing, spreading and drawing 6,333 cords	29,207.72
Total expenditure.	33,941.18

$29,207.72, divided by 6,333 cords of stone, equals	$4.61	per cord
Add for coal	.18	‘‘ ‘‘
‘‘ ‘‘ ‘‘	.17	‘‘ ‘‘
‘‘ ‘‘ ‘‘ dynamite	.17	‘‘ ‘‘
Total cost for crushed stone	4.96	‘‘ ‘‘
Add for rolling	.43	‘‘ ‘‘
Total average cost per cord for 1909 ..	5.39	‘‘ ‘‘

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* Extracted from a paper read at the recent convention of the Ontario Good Roads Association.

Preparation and Use of Road Metal

By A. Rankin, Collin's Bay, Ont.

We will not deal with the cost of the material on the road as it depends so much on the size of the plant, class of stone, and the length of haul, and for this reason it is not fair to compare the cost of road construction in one section with that of another section, even in the same township. The cost of laying the metal on the road should be reduced to a minimum, which can only be done when all the teams are working to full capacity with the least handling of material that is possible.

The preparation of the material may be divided under two heads: The preparation of the material to be placed on the road, and the preparation of the road to receive the material.

Whether the source of the metal be a quarry or field stone, sufficient coarse material should be piled convenient to site for crusher, and arrangements made for keeping a surplus of coarse material on hand as well as supplying the crusher, and a bin of sufficient capacity to provide against a temporary shut-down of the crusher for minor repairs or adjustment. The time and labor saved in loading from the bin compared with loading from a pile will far more than pay for the sinking fund and interest on the cost of the bin.

The metal should be screened on coming from the crusher, first separating out the dust and chips up to ⅜ inch, then sorting out the 1 inch, 2½ inch and tailings. Where new construction work is being done, the proportion of tailings and 2½ inch should be much greater than where repair or re-construction work is being done; also very hard or tough metal will stand to be more finely broken than the softer metals.

In preparing the road surface to receive the metal, the surplus dust or fine material on the surface, as well as the false berm at the edge of the ditch, which has been formed by the growth of grass and collection of dust, should be removed, as it holds the water and softens the roadway. To do this the use of a scarifier is used to advantage to loosen up the material so that the grader can do with one cut what it would take three or four cuts to accomplish with unloosened material.

It is not advisable to place the metal on a smooth hard surface of a macadam roadway. It takes more material than is necessary to form a good wearing surface, as a thin layer of metal will not bond on the smooth surface. The old surface should be roughened to give a bond between the old and new metal. To accomplish this the scarifier drawn by a traction engine is the most economical method. The traction engine should also be used for hauling the grader.

After the material has been loosened, it should be trimmed with the grader, and the broken stone spread, and levelled and rolled with the steam roller. By the use of the steam roller, a thinner coat of metal can be put on and bound into the loosened macadam below, and a good road formed at once, instead of allowing the trafic to kick the loose stone about and take a long time to make a passable road.

Pumping Concrete

Many attempts have been made to pump concrete, generally resulting in costly failure. With ordinary concrete it is safe to say that pumping is practically impossible. Engineering-Contracting, answering an inquiry on this subject, describes a trial made by one of its editors. It was found that by using stone no larger than ¾ in. in any dimension and making a rather wet mixture a certain degree of success could be obtained after 30 minutes' continuous mixing. The long mixing made a concrete in which there was little tendency on the part of the aggregates to separate, but it took a very long time to set. With the long mixed materials a [illegible] pump was the only pump that could be used, and a good deal of concrete was wasted. It was necessary at intervals to pump water [illegible] until the pump and pipes were clean, wasting the concrete that was in them at the time the water was introduced. Certain types of pumps are used to inject thin cement and sand grout into crevices, but grout is not concrete.

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* Extract from paper read at the annual Convention of the Ontario Good Roads Association.

Oddfellows' Hall, New Westminster

The accompanying illustration is that of the Oddfellows' Hall, New Westminster, B.C., which is built of concrete blocks. The structure was erected during the present year, Smith & Buckland, contractors, of New Westminster, having the entire contract. The blocks are all rock-faced. London concrete block machines were used.

The concrete blocks are made of a proportion of five parts of gravel to one part of cement, and are faced with a mixture of two parts sand to one part of cement. They are of a good uniform color, and the entire structure has an appearance of neatness and durability.

A feature of note is the neat appearance of the window-heads in this structure, which are made from cement, and capped with a return mould. Window-heads of this type cost only about one-half that of brick arches. They will carry as much weight as stone or any other building material.

Oddfellows' Hall, New Westminster, B.C.

Window-heads and sills of this type should always be reinforced with ¼-inch iron bars, which will give them sufficient tensile strength to meet all ordinary requirements. Concrete blocks make one of the best materials for buildings of this type.

At the annual meeting of the Association of Dominion Land Surveyors at Ottawa, Ont., the following officers were elected: Dr. W. F. King, of Ottawa, Honorary President; Mr. Thos. Fawcett, of Niagara Falls, President; Mr. P. R. A. Belanger, of Ottawa, Vice-President; Mr. A. W. Ashton, of Ottawa, Secretary-Treasurer; Executive, Messrs. J. D. Craig of Ottawa, C. F. Aylesworth, of Madoc, Ont., and F. T. Nash, of Ottawa.

At the annual meeting of the Engineering Society of the University of Toronto, held last week, the following officers were elected for the ensuing year: President, A. D. Campbell; first vice-president, R. L. Dobbin; vice-president for civil engineering and architecture section, W. H. Murphy; mechanical and electrical section, [illegible]; mining and chemical section, [illegible]; treasurer, W. A. Gordon; corresponding secretary, A. H. [illegible]; recording secretary, [illegible]

Incompleteness of Plumbing Specifications

Meagre Details Prepared by Average Architect Claimed to Prevent Close Figuring — Practical Suggestions as to what Proper Plans Should Show

By O. B. Craig*

There is nothing entering into the construction of the modern building which is more intimately associated with the health and comfort of its inmates than the plumbing. Under this general term is included the drainage from and water supply to the fixtures, the proper arrangement of all traps and vent lines, the heating of the water and the apparatus therefor, the proper installation of all plumbing fixtures, and such mechanical appliances as house and fire pumps, suction and supply tanks, etc.

The plumbing system for a building may be very aptly compared with the circulation and intestinal systems of the human body. The water supply lines are the arteries which carry the life giving fluid to the remotest corners of the structure; the sewers the intestinal canal through which the waste matter is discharged. The proper action of the one is just as important to the building and its inmates as is the function of the other to the human body.

Architects' Plans Lack Information.

Notwithstanding the important bearing of the plumber's work it is, as a rule, given very little study by the average architect in the prepration of his plans and specifications. He will elaborate most exhaustively on his construction and materials which go to make up the superstructure, making numerous full size detail drawings of doors, windows, interior and exterior trimmings and decorations, but when it cose to the plumbing, the most important of all from the standpoint of health and convenience, he is woefully lax in his instructions to the plumbing contractor. And it is greatly to the credit of the much maligned plumbing trade that such good work is produced with such meagre assistance as the plumber gets from his plans and specifications.

The architect in drawing up his contracts usually stipulates that the plumbing must conform to the drawings and specifications, which would necessarily imply that the drawings and specifications contained all the information that might be necessary for the plumbing contractor to not only give an intelligent figure on the work required, but also to carry out his contract in a manner to insure the very best results obtainable. But let us turn to those same drawings and specifications, and what do we find? The average building plans show us a toilet room located here, a sink there, lavatories scattered promiscuously, with a few lines on the basement plan to indicate the general direction of the sewer, but nothing more. It is up to the plumber to figure, if he can, how he is to reach the various fixtures with his lines; where to locate his water heater, pumps, tanks, etc.; where to install his risers and vent lines, and how he is to keep out of the way of the steel contractor, the heating contractor, the electrician, the sheet metal contractor, and, in fact, every other artisan on the job; for it seems to be the generally accepted rule that the plumber must give way to all of these more favored trades and crowd his work into impossible out of the way places, working under handicaps which would hardly be tolerated in other lines of building construction.

On the drawings he finds not a line to indicate where his water lines are to go or the size thereof; and as for locating his basement machinery, let him get along with whatever space the other contractors have no use for. The incomplete nature of the drawings is oftentimes to some extent recompensed by a carefully detailed specification, but, unfortunately, the specification is generally indefinite and inadequate, abounding in such terms as "pipes of ample size," "valves satisfactory to architect," "water heater of sufficient capacity," etc., thereby placing upon the plumber almost the entire responsibility for the designing and proper working of the system, and woe betide him should his judgment be at fault.

Meagre Details Prevent Close Figuring

A case in point came to the writer's notice not long since. A large building involving more than the usual amount of plumbing was designed, and plans were submitted to some half dozen plumbing contractors with request for bids on the work. Beyond showing the location of the various toilet rooms and the fixtures therein, there was not a line in the drawings to guide the bidder, and, as for specifications, there were absolutely none, each bidder being requested to submit his own specification with his bid. Each of the bidders, after spending a great deal more time in figuring the job than would otherwise have been necessary, submitted his proposition, but all to no purpose, as such a wide variation of ideas was found and such a lack of uniformity in the cost of the work that the designers were compelled to readvertise for bids on a uniform and carefully drawn plumbing plan and specification.

What Plumbing Plans Should Show.

The plumbing for a building should be so indicated in the drawings and described in the specifications as to cover everything required, and so clear and concise as to be readily understood by the average plumbing contractor. The positions of all mechanical appliances in connection with the plumbing should be clearly shown upon whatever floor plan such appliance may be located. All runs of piping through basement, together with the size of same, should be concisely indicated in the basement drawing. House traps, bell traps, area drains, sump pits, conductor lines, etc., should be located beyond dispute. Branches to risers, with size plainly indicated, together with location of such risers, should be shown, and valves and stop cocks should be plainly indicated.

In addition to the plumbing lines shown on the plans there should be prepared a riser diagram showing the serving of each and every fixture on each floor of the building. This riser diagram should show clearly all water lines, waste lines, soil lines, vent lines, fire lines, etc., at each and every floor throughout the building giving the relative position and arrangement of the waste and vent lines for each fixture, with the sizes of all lines plainly designated. Pipes of the various characters can be indicated by different kinds of broken or dotted lines, with a properly arranged index on the drawing, showing the kind of service each line performs.

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* Read at the Annual Meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers.

Where there are groups of fixtures, and where it is desirable to show connections to pumps, house tanks, filters, etc., it is advisable to prepare, on a larger scale than is ordinarily used, a detailed drawing showing the exact arrangement of all piping, together with all fittings, joints, valves, traps, etc.; but where the plumbing is ordinary straight and simple work such detailed drawing may be omitted.

Information Specifications Should Give.

The specifications should indicate in the clearest possible manner the quality of the materials to be used and the method of installation. The location, size, depth and general direction of the street sewer, if there be any, should be clearly described, and if there be no street sewer, the final disposition of the sewage should be given in detail.

The location and size of the city water main from which the water supply is to be taken should be plainly stated along with the water pressure at source of supply. This information can be obtained in any well regulated municipality, where it is always kept on file. The specification should list accurately the number of each style of fixtures to be located on each floor of the building and should give such an accurate and detailed description of such fixtures and the trimmings as to leave no room for doubt as to what is desired.

Noises in Pipes

Summing up many contributions to Domestic Engineering from practical men in the trade concerning the causes of noises in pipes and how to overcome this difficulty, the following resume covers the matter in a nutshell:

Cause: High pressure of water. Remedy: Substitute tank pressure; partial remedy, casing in the pipes and packing in tightly either mineral wool or asbestos fibre. Another remedy is to put in a pressure regulator near the cellar wall where the water supply enters the building and still anothr is to put discs at each one of the cocks on the premises. It is claimed that these prevent water hammer and splash as well as noise. Another remedy is the use of air chambers on the hot and cold supply to the fixtures.

Cause: Partial stoppage in the service pipe by an obstruction such as galvanizing partly filling the pipe and causing vibration when water is passing through with great velocity. Remedy: Take out pipe from main to the point where first branch is taken off and replace with a good smooth-bore pipe.

Cause: Too great vibration caused by velocity of the water. Remedy: A bit of rubber packing used between joists or studding or between pipe and hangers. The water pipe should not be allowed to rest against soil or heating pipes, as they will carry the sound.

Cause: Loose packing on faucets. Remedy: Do not use rubber packing; use fibre or hard leather.

Cause: Corporation stop at main too small or choked with sediment. Remedy: Examine it and repair defects.

Cause: Service pipe too small, ends not reamed out. Each successive end with burr telephones the noise ahead. Remedy: Self-evident.

Cause: Air chambers become waterlogged and each stroke of the faucet can be heard distinctly. Remedy: Draw off the water from the building.

Loose washers in fixture faucet may be the cause of the noise.

If noise has developed recently the cause has recently developed also and is probably a loose part in a faucet or valve. Pipes fastened to wood should have some non-conducting material between.

Risers not well anchored with non-conducting material between them and wood would cause vibration of the entire pipe.

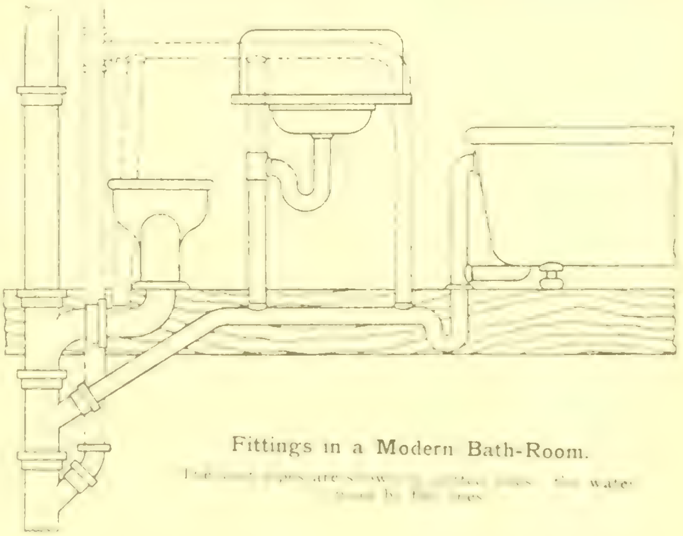
Stopcock may be partly closed. After opening it wide there may be no noise.

Supply pipe may be too small so that when a number of faucets are opened the water must necessarily travel through the small pipe at a high velocity.

If when the stopcock is shut off the noise ceases, look for a leak between the stopcock and the main.

A Modern Bath-Room

With modern fixtures and modern methods the bath-room of to-day may become, with a comparatively small cost, a thing of great beauty. No one attempts to make a comparison of the old-time sheathed-in bath-room work with that of the present day so far as beauty and artistic effect are concerned. When the fixtures were sheathed in, neither light nor air could circulate about them, with the result that there was constantly a musty, if not foul, odor present. The bath-room of to-day can be made as clean and wholesome as the parlor.


Fittings in a Modern Bath-Room.

[illegible]

Many factors have taken part in the advancement of sanitary construction, and the many improvements that have been made are not to be credited to any one, but to many and varied influences. In the first place, people have been educated to demand and expect the best possible living conditions, and the result is that the standard is constantly being raised. Municipal plumbing ordinances are constantly being revised or added to in the effort to provide the most perfect sanitary conditions. Competition is another factor which has brought results. Also, the plumber, whose duty it is to execute the work of construction, has been most influential in bringing about improved conditions. It is he who is better able than others to observe the good points of different methods and devices as well as their deficiencies, and to him is due the credit of many improvements in the construction of the plumbing system.

The accompanying sketch shows the method of draining and venting a modern bath-room according to the latest regulations. This method will work equally well in a one or a ten-story building.

Trade News from Montreal

Opening of Spring has Bouyant Effect on Building Operations Good Season Anticipated in this Section Supply Men Cheerful

Office of the Contract Record,
March 14th, 1910.

The excellent spring weather conditions prevailing in the Montreal district are having a decidedly buoyant effect upon building operations in general. Contractors are awake to the fact that an extra early start will be made this year in building construction, and are laying their plans accordingly. Architects have advanced their prospective plans far enough in many cases to ask tenders for construction, and, from this time on, we may expect to hear regularly and frequently from the designers' offices.

Gradual Improvement in Supply Business.

The supply business is also showing a tendency to shake off its winter lethargy. Dealers in cement report that this article is beginning to move more freely. It is now quoted at $1.90 per barrel, f.o.b. Montreal. This is not the increase which appeared on the surface, but includes the cost of package; every barrel contains four bags, which are returnable at ten cents each, the actual wholesale price being $1.50 per barrel. Firebrick in the various grades is reported inactive, with no price changes of note. In another month the brick yards will be open, and then a rush for this line of supplies may be expected. Crushed stone is not in much demand just now, since very little foundation work is being proceeded with as yet. The poor roads in and about the city have been responsible to a great extent for the somewhat quiet conditions of the supply trade.

February Building Statistics.

February building figures are rather disappointing in view of the excellent showing made during the month of January. In all, 107 permits were issued from the Building Inspector's office, 72 of these being for new buildings. In point of numbers this showing is slightly behind the same period in 1909, when 83 permits for new construction and 37 for alterations were issued.

Comparing, however, the values of permits issued during these two periods we find that in 1909 the total registered value of permits reached $235,330. In February, 1910, this value reached $264,030, so that on the whole the increase in the building figures is very creditable.

Inspection of City Contracts.

The Board of Control promise to inaugurate a better system of checking civic contracts. A large amount of money will be expended this season for walks and pavements, and it is the intention of the Board to see that contracts are rigidly adhered to. To carry this into effect it is anticipated that an extra staff of inspectors will be employed to check the work of contractors and to see that the proper proportions of cement is used in all cases.

Another innovation which the Board have under consideration is the posting of copies of all civic plans and specifications in the Montreal Builders' Exchange. This move would be a welcome one, and would probably result in a more general interest being awakened in this work on the part of Montreal contractors.

The promoters of the proposed subway for Montreal are apparently working energetically in the preparation of the necessary preliminary details for this extensive project. It is stated that the route of the new subway will connect the eastern and western ends of the city, and at the same time a cross line will be built from the riverfront northward. There is a persistent rumor that the Canadian Northern Railway Company will be prepared to give the scheme every support, since it would allow them an excellent entrance way to the centre of the city. The organization of a syndicate to carry out this work is said to have been completed. It involves English, American and Canadian capital to the extent of $20,000,000. Montreal financiers said to be interested in the project are Messrs. Rudolph Forget, M.P., H. S. Holt and W. G. Ross.

Items of Interest.

Considerable activity in building circles is promised with the opening of spring. The district along the shore of Lake St. Louis, from Lachine to Ste. Anne de Bellevue, is growing in popularity as a summer resort, and several contracts are being made for the erection of summer cottages of the bungalow type.

A Public Utilities Commission for the Province of Quebec was recently inaugurated. The first members of the new commission are Col. Hibbard, of Montreal, chairman; Sir J. George Garneau, Quebec, and Mr. Charles Laberge, Professor in the Polytechnical School, Montreal.

Our Winnipeg Letter

Office of the "Contract Record."
Winnipeg, March 12, 1910.

The season is opening up rapidly, and at some points of the West building construction is already in active operation. There is some talk of a shortage of labor during the coming season, but there are many who fear more trouble from a shortage of supplies than from the other source. When the price of lumber and building material came down a little and the building campaign was being carried on, it was the home builders in this city, augmented by the agricultural districts, that responded most and did the greater part of the building. This work naturally did not call for so much structural steel and brick and lumber. The agricultural districts built partly because they were prospering. The building in the suburbs of the cities was encouraged by the cheapness of lumber and building material and by the desire on the part of many to have their money invested securely in a home. The agitation for building, however, did not encourage people to invest extensively in buildings until the close of the last building season, despite the cheapness of material and the plentiful supply of labor.

To-day there are all kinds of building projects under consideration in every town and city throughout the West. In Winnipeg, especially, there are an immense number of important buildings talked of for 1910. According to the files of the Winnipeg Development and Industrial Bureau, inquiries are more numerous than ever before. Especially active in this way are manufacturers of the United States and Great Britain. One of the most likely firms in this connection are George Christie, Limited, Glasgow, who are looking for a Canadian outlet for their woven wire goods. Another firm which is negotiating for the establishment of a large factory in Winnipeg is one of the largest strawboard and paper manufacturers in the world. We learn that a representative is expected from two of England's largest gas and oil engine makers, that several big British concerns engaged in automobile and traction manufacture have been making enquiries, and that, following upon the Canadian cement merger, inquiries have been received from reliable cement manufacturers of London and Newcastle-on-Tyne. The industrial future of Winnipeg is assured.

The building season here has already opened. Work has commenced in connection with the new Bank of Montreal building, to be erected at the corner of Main Street and Portage Avenue. The contract amounts to about 1¼ million dollars, but is not looked upon as one of great magnitude. The contractors for the new structure are Norcraft Bros., while the sub-contractor for excavation and demolition is D. D. McOuatt. The work of tearing down the only Canada Permanent block is also under way.

Labor and Other Predictions

It is not probable that there will be any dearth of skilled labor this year, but developments in this field will, of course, depend largely upon what transpires in Eastern Canada, and the United States. It is possible that there may be some difficulty in obtaining sufficient help in railroad construction. A prominent labor agent informs us that he already has work in sight for nearly 30,000 unskilled laborers. "Last year," he says, "was a very active one, and this year promises to be more so. I foresee considerable difficulties in getting enough men to fill the various jobs, especially on railroad construction. Hitherto the contractors have relied largely upon Poles and Italians, but there will not be so many of these available this season. Last year they saved so much money that they were able to make a record rush to Europe at the end of the season. It is not to be expected that half of these will return, and we are wondering where the men will be found." Prominent contractors in the building line, however, are unanimous in the assertion that here will not be any shortage of labor in their department. A large influx of mechanics is expected from the United States, while there is every possibility of a healthy immigration from the British Isles.

C. W. Sharp, of the contracting firm of Sharp & Sons, anticipates little trouble in the building trade during the coming season. Interviewed recently, he said, "This is going to be a banner year in every respect. It will be greater far than 1906, which was the greatest year in Winnipeg's history up to date. The contractor may experience a little shortage in some material, but not in any of the leading lines. Personally, I have been delayed on the Great West Life building owing to the difficulty in getting marble from the Kootenay."

Frank E. Halls, of the Carter-Halls-Aldinger Company, is very optimistic. He says: "I do not think the estimate of 15 millions for Winnipeg building is any too big a computation. We shall be able to handle satisfactorily all the contracts put into our hands—provided we get them early enough. The trouble with Winnipeg people is that they consider too long and then expect the building to be up the next minute. There will be lots of work for everybody and at the worst a little shortage of labor towards the close of the season."

Mr. E. A. James, editor of the "Canadian Engineer," has been appointed town engineer of North Toronto.

Weight of Building Materials

The following convenient table of the approximate weight per cubic foot of various buildingg materials is furnished by a leading architect and consulting engineer:

	Weight.
Metals.	
Bronze	552
Copper	550
Iron, cast	450
Iron, wrought	480
Lead	712
Steel, structural	490
Timber.	
Cedar	23
Chestnut	41
Cypress	29
Fir	32
Hemlock	25
Oak, white	50
Pine, white	24
Pine, yellow	35
Spruce	25
Masonry.	
Asphalt	130
Blue stone	160
Brick in lime	120
Brick in cement	130
Cement, Portland	90
Concrete	140
Gneiss	160
Granite	165
Gravel	120
Limestone	170
Marble	165
Sandstone	145
Slate	170
Terra cotta	110
Tile	115

The incorporation is announced of the Dominion Cement Company, Limited, of Montreal. The capital stock is $5,000,000.

The revision of the salary list for the city of Montreal has resulted in a wholesale cutting of the wages of civic employees. It is interesting to note, however, that Mr. J. R. Barlow, City Surveyor, and Mr. Stuart Howard, of the Sewers Department, were recommended for substantial increases, which have since been sustained by the City Council.

In the House of Assembly at Halifax, N.S., last week there was introduced a Government measure providing for compensation by employers in cases where workmen lose their lives by accident or are partially or totally incapacitated for work. In case of death the amount payable where a workmen has been employed for three years shall be one thousand dollars, or a sum equal to his earnings of three years, whichever is larger, but not to be more than two thousand dollars. Where total or partial incapacity for work is caused through accident he shall during incapacity be paid weekly 50 per cent of his earnings in the previous twelve months, but the amount shall not be in excess of five dollars per week. The act provides for arbitration for carrying out its provisions.

Ontario Land Surveyors' Annual Convention

The annual meeting of the Ontario Land Surveyors' Association was held at 96 King Street West, Toronto, March 8-10. Among the many interesting papers read at this meeting was one entitled "The Principles of Road Supervision," by Mr. W. O. McLean, Toronto, Provincial Engineer of Highways. Mr. McLean stated that the roads of Ontario were built equally as well as those of England, but that the great difference was in the manner of improving them. He criticized the fact that any sort of an engineer could set himself up as an expert in road building. Another interesting paper, which it is hoped to publish in a later issue, was that entitled "A Concrete Box Sewer," submitted by Mr. Owen McKay, Walkerville, Ont.

In "The Autobiography of an Old Surveyor," Mr. Chas. Unwin, of Toronto, related his personal experiences in a most interesting paper. Mr. Unwin has lived under eighteen mayors in the city of Toronto and under four English sovereigns. He can remember the time when wild pigeon shooting was a favorite pastime in the district now known as the Allan Gardens, Toronto, and when the population of the city was considerably less than 20,000.

Mr. H. W. Selby, of Toronto, was elected President for the ensuing year, Mr. J. F. Whitson, of Toronto, Vice-President, Capt. Killaly Gamble, Secretary-Treasurer, and Messrs. E. T. Wilkie, of Carleton Place, and H. L. Sston, of Toronto, auditors. The following nominations were also made for Council; Messrs. C. H. Fullerton of New Liskeard, P. S. Gibson of Willowdale, E. T. Wilkie of Carleton Place, C. J. Murphy of Toronto, J. M. Watson of Orillia, and James Hutcheson of Toronto.

Armored Concrete*

Concrete pavements, properly laid, during the past twenty years show one defect, that is, in the joints. Among the first laid in the country were those laid in Bellefontaine, Ohio, about seventeen years ago. After seventeen years of service these pavements are still in good condition, excepting wear at joints. Other well-constructed pavements in different cities show the same defect, or weakness. This is about the only valid objection to concrete pavements, and it is overcome by the "Armored Expansion Joint." This device was originated and used in 1909 by R. D. Baker, of Detroit, Mich. The armor consists of a steel plate at the edge of expansion joints wherever necessary to provide for expansion and contraction. Where such a joint is to be made each edge is protected first by a steel plate 3-16 in. wide. Between the two edges thus protected is placed a board. When the board is removed the cavity left by its removal is filled in with proper paving pitch or other suitable material. Some of the pavements thus constructed in Detroit have been subject to severe tests in the way of heavy traffic, and seem perfectly satisfactory. The added cost is little compared to the lasting improvement in wear.

Apropos of the Toronto pipe contract, Mr. Richard Grigg, of Montreal, Dominion Trade Commissioner, in a recent communication to City Engineer Rust says: "Any buyer who invites bids merely for the purpose of making a price for another firm will soon find that first-class concerns will refrain from the expense and trouble of submitting tenders at all."

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* Contributed by David Todd, Walkerville, Ont.

Personal News and Notes

Mr. L. M. Jones, late of Toronto, has entered upon his duties as assistant city engineer at Port Arthur, Ont.

Mr. R. S. Lee, consulting engineer, Montreal, has obtained the degree of Mem. Inst. C.E. (England).

R. E. Speakman, city engineer of Brandon, Man., has been appointed city engineer of Victoria, B.C., at a salary of $3,500 a year.

With a view to assisting architectural draughtsmen, the Manitoba Association of Architects has instituted a class in architectural design at Winnipeg.

Ottawa building permits for February, 1910, were valued at $97,200, compared with $66,940 for February of last year.

Building permits at Victoria B.C., ast month represented a total value of $140,960, an advance of $27,280 on February, 1909.

Mr. B. S. Mackenzie, of the Quebec Bridge Co., Montreal, has been appointed assistant engineer on the G. T. P., with headquarters at Winnipeg.

Mr. N. D. Wilson, A.M., Con. Soc. C.E., has opened a temporary office at 41 Murray Street, Toronto, where he will engage in a municipal and general engineering practice.

The total amount represented by building permits issued at Vancouver, B.C., last month was $880,795. The February, 1909, total was $409,655. For the two months of the respective years the totals were $1,512,106 and $77,285.

Building permits issued at Winnipeg, Man., during February, 1910, represented a value of $318,600, compared with $158,500 for February, 1909. The total for the first two months of the year was $502,000. This is the first time in the history of the city that the figure for this period has exceeded the half million mark.

Building permits issued at Toronto during February, 1910, amounted to $860,440 compared with $853,035 for the corresponding month of the previous year. The totals for the first two months of 1909 and 1910 were respectively $1,233,060 and $1,542,528.

A meeting of the Central Railway and Engineering Club was held at the Prince George Hotel on Tuesday, March 15th, when Mr. M. J. Quinn, manager of the National Equipment Co., Toronto, read an interesting article on "Sewage Disposal and Water Supply."

Mr. J. A. Orbits, Assistant Engineer of Public Works, Mount Clemens, Mich., was a recent visitor at the office of Mr. A. F. Macallum, City Engineer of Hamilton, Ont. He stated that his city had been universally metered for water, and that the consumption had decreased remarkably as a result.

Mr. J. E. Griffith, C.E., formerly government agent at Golden, B.C., has been appointed assistant to Mr. F. C. Gamble, Provincial Engineer, B. C. Department of Public Works. Mr. Griffith returned recently from the Argentine Republic, where he was engaged on railway work.

Building permits issued in Toronto last month represented a total of $860,440, an increase of $7,405 over the total for the corresponding month of last year. The total for the year to date stands at over a million and a half dollars, an increase of $300,000 over the first two months of 1909.

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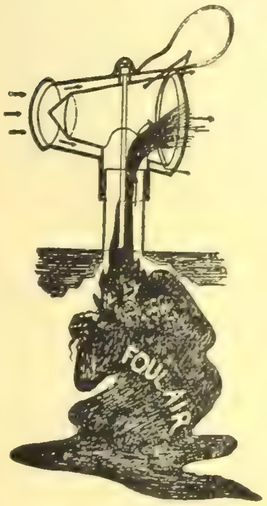

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Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

[illegible] Agents.—Enquiry is made by a Lancashire firm for the name of a reliable firm in Vancouver open to take up an agency for the sale of steam engines and boilers.

[illegible] Gates, Railings, &c.—A firm of architectural metal workers in the English Midlands, making gates, railings, electric lighting fittings, &c., wish to enter into correspondence with prospective agents or buyers in Canada.

356. Street Paving Process.—A correspondent in London wishes to bring to the notice of interested parties in Canada a new sanitary dustless paving process.

357. Agents.—A London firm of engineers, boilermakers, machinery merchants and traction haulage contractors, seek agents in Canada.

358. Tiles.—A South of England firm, manufacturing floor, wall and hearth tiles, ceramic mosiac, constructional faience, and terra cotta, desire to extend their Canadian connections.

362. Rustic Houses, Chairs, Vases &c.—A Chesire firm manufacturing rustic houses, rustic chairs, seats, vases, bridges, porches, arches, tables and every description of rustic work, ask to be placed in communication with likely buyers or representatives in Canada. A member of the firm is visiting the Dominion in April, and would call on interested parties.

415. Pottery, Tiles &c.—An engineer in the South of England, is open to advise Canadian firms in the sanitary pottery, glazed and salt-glazed firebrick, tile and majolica glazed faience, &c., manufacturing industry, and would, if desired, proceed to Canada.

416. Pulley Makers and Ironfounders.—A firm of engineers, pulley makers and ironfounders in Yorkshire, desires to be placed in direct communication with actual Canadian buyers of their manufactures.

From Vancouver and the Coast

The Columbia Cement Glazed Pipe Company, Limited, have commenced the manufacture of cement glazed sewer pipe in their factory on False creek. It is likely the city's new plumbing bylaw will permit the use of cement pipe in all cases where the vitrified earthenware pipe is now in use.

Mr. W. A. Gilley, a prominent citizen of New Westminster, entertains a rosy prospect of the future of the Fraser river as regards the location of industries and wharves for transportation companies. It is the expense attached to maintaining timber structures in salt water that Mr. Gilley thinks will eventually result in an enormous amount of wharves being constructed on the Fraser. As an example of how quickly teredoes will destroy piles, Mr. Gilley cites an instance of a wharf he built for the Tyee Smelter Company, at Ladysmith, some time ago. Four months after completion, the bottom of every pile in the wharf was destroyed by teredoes. These pests cannot live in fresh water. They are infinitesimally small and will enter a pile through a hole the size of the smallest needle head. Inside the pile they grow rapidly, eating away the wood and taking on a whitish shell the thickness of an egg shell. All kinds of preparations have been tried to prevent their destruction of piles, but few have been successful, and with those that are, the expense is considerable. The best solution of the teredo difficulty, says Mr. Gilley, is to build the wharf in the Fraser river.

Vancouver is getting away to a good start in the 1910 race. The building totals for January were $631,311, as compared with $365,630 in January of 1909, a gain of over 75 per cent; the Land Registry revenues reached $15,474.20, as against $7,969 last year; the bank clearings were $29,274,530, as compared with $16,407,127; and the customs revenue topped the January, 1909, total by $125,862.

Half-a-dozen large apartment houses are under construction and others are projected. These combine all the latest improvements known to architects, and as a rule the apartment suites are rented ahead. As the city's boundaries extend, those who wish to enjoy city life to the full, sell their homes at a big advance and flock into apartments down-town.

Another ten storey office building is to be added to the number of tall structures now "decorating" the city. It will be erected on a site adjoining the Wood's hotel, Hastings street, for Mr. William Holden, the well-known real estate dealer.

The Vancouver City Council has decided to erect a new incinerator for the destruction of garbage, at a cost of $70,000. It will be a five-cell plant, capable of consuming 70 tons of garbage daily.

Plans are being prepared for a "skyscraper" considerably larger than the Dominion Trust Building, though not quite so high, being limited to ten storeys. The site chosen is between the handsome Winch Building and the Vancouver Club, on the north side of Hastings street.

The Vancouver & Prince Rupert Meat Company began work on February 9th on their new packing plant at New Westminster, where eleven acres of land have been purchased. The plant will cost about $60,000.

The programme of C.P.R. extensions in Western Canada this year is extensive, embracing some 300 miles of new lines in the prairies and British Columbia, and involving an expenditure of from eight to ten million dollars. This is in the building of new lines alone, and takes no account of the new stations, such as that at Regina, which will cost when completed over half a million dollars, and the million-dollar bridge which is to connect Edmonton with Strathcona. The year will witness the completion of lines across the prairies and give the company alternative routes which may be used for main line purposes. There will be begun the double tracking of the transcontinental road through the wheat plains by building to Portage la Prairie.

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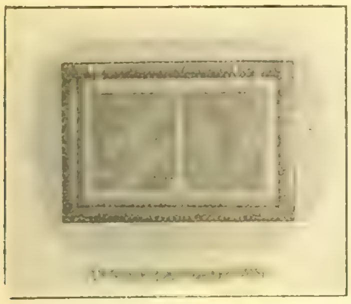

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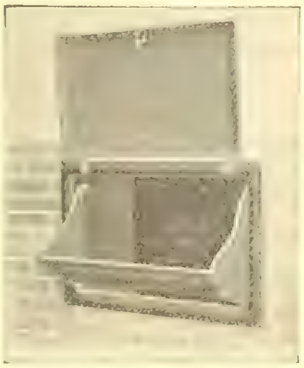
These cuts show the Coal Chute both open and closed. This is the new way to equip a house so as to do away with the annoyance of broken windows and disfigured window frames.

The door when open protects the wall above the chute, and when closed locks automatically, and is positively burglar proof.

The "MODEL" is supplied with rubber glass so that light can be admitted to the basement.

Made in three sizes. Send for our descriptive booklet.

THE DOWN DRAFT FURNACE COMPANY, Limited
Galt, Ontario, Can.

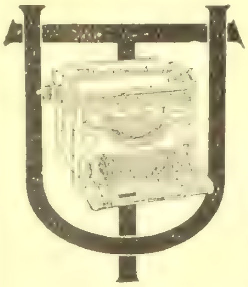


The "MODEL" with rubber glass.

Maple Flooring

Perfect mill work and excellent grades are characteristic of our flooring. Prices right. Let us quote you.

Woodstock Lumber & Mfg. Co.
Woodstock, Ont. Limited



This is the mark of the Underwood — more extensively used in Canada than all other makes of typewriters combined. No matter what machine you have used, or are using, you will ultimately buy the Underwood.

United Typewriter Co.
Adelaide Street E., TORONTO

Hard Laurentian

Birch Flooring

Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
Bored and Bundled.

Manufactured by

The Standard Mills, Limited
55 St. Francois Xavier St., MONTREAL
Write for particulars and samples.

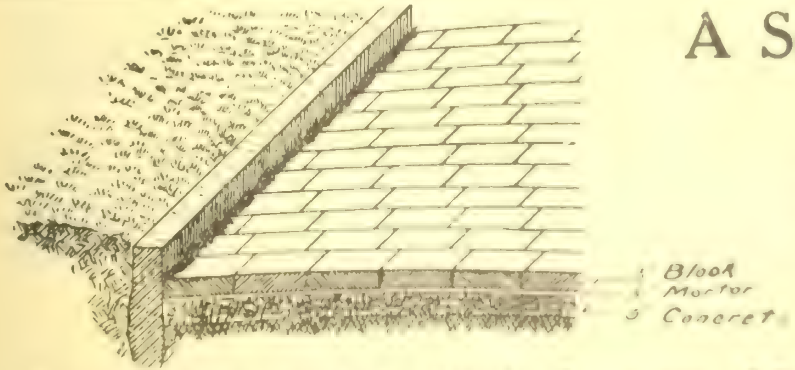
CONTRACTORS AND ARCHITECTS

are invited to get our quotations on Wire Reinforcing. We are operating the largest and oldest wire goods plant in Canada. Our

Wire Reinforcings

are made in all strengths of material and in any lengths required. They have been declared especially desirable on floor and roof work. [illegible]

The B. Greening Wire Co.
Hamilton, Ont. Limited **Montreal, Can.**



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

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HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

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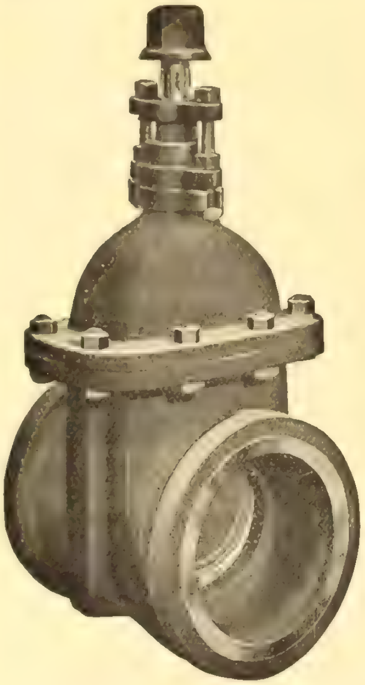
GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

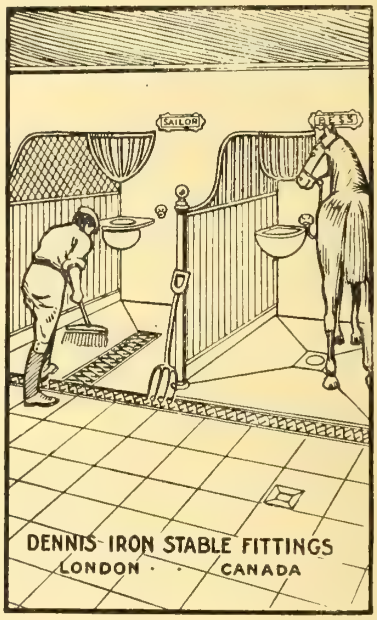


Kerr Valves

are made in brass and iron, have full area when open and are tight when closed. Latest designs and tastefully painted.

The Kerr Engine Company
Limited
Hydrant and Valve Manufacturers
WALKERVILLE, Ontario

The Modern Stable



Our Iron Stable Fittings give the stable a modern attractive appearance, make it wholesome and sanitary—and they never wear out.

We make a special feature of this line and quote prices that make it possible to furnish a stable in a complete and up-to-date way at a very moderate cost.

Send for Special Booklet and Price List.

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London, Canada Limited
Toronto Office: 103 Pacific Building

James Thomson, President. J. G. Allan, Vice-President. James A. Thomson, Secretary. Alex. L. Gartshore, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.

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Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

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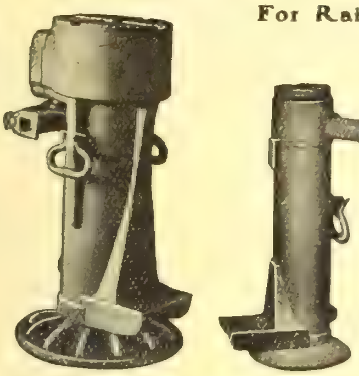
THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use



Made by practical Jack Builders. Material: best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

MANUFACTURED BY

H. & E. Lifting Jack Company

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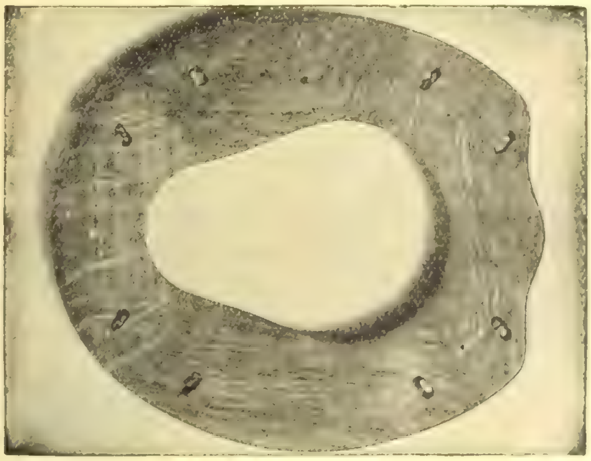
Stock carried by Frothingham & Workman, Ltd., Montreal

"Never Split" Closet Seat

The superiority of this seat over all others is so evident, architects and builders who have their reputation and clients' interests at heart should specify and insist on the "Never Split" seat being a part of every closet combination they install

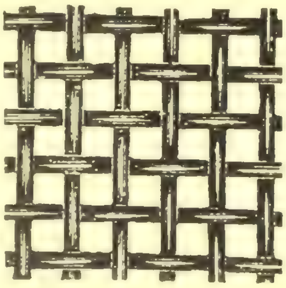


Made on scientific principles and combining Greatest Strength, Rigidity and Sanitary Value. Have no equal for fine appearance and lasting qualities. In addition to the tongue, groove and glue of the ordinary seat each joint of the "Never Split" is Steel Bolted making them absolutely impossible of splitting, warping or cracking. Guaranteed to give fullest satisfaction. Get full particulars—its worth while—write to-day

Goderich Organ Co., Limited Goderich Canada

Canada Wire Goods Mfg. Co.

Hamilton



Manufacturers of

Double Crimped Wire Cloth and Wire Screening

for all purposes of Steel, Iron, Brass, Copper, Bronze, Galvanized and Tinned Wire, etc.

There is no kind of Wire Fabric required in the production of any machine or manufactured article that we cannot furnish.

—We also manufacture—

Bank and Office Grilles and Ornamental Iron Work in all finishes

Jail and Prison Metal Construction, Wire Lockers, Riddles, Laboratory Testing Sieves and General Wire Work of every description.

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WE BUILD

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of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

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Railway and Highway Bridges

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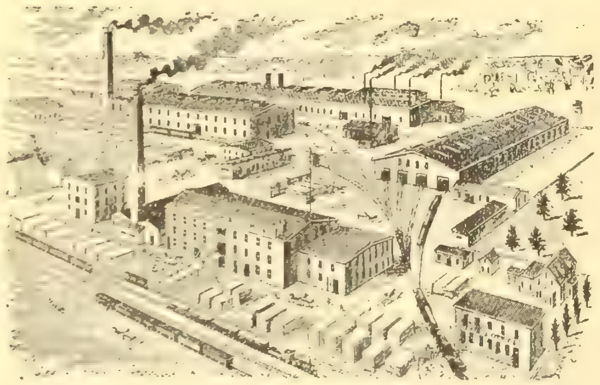

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SCHOOL DESKS A SPECIALTY

We manufacture all kinds of building materials, including cast iron columns, cresting, sash weights, etc

In addition to our large stock of native lumber, we are now carrying about one million feet of foreign lumber, including oak, walnut, ebony, whitewood, basswood, red cedar, Douglas fir, mahogany, &c.

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——Bridge and Construction Dep't.——

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All Structures of Steel

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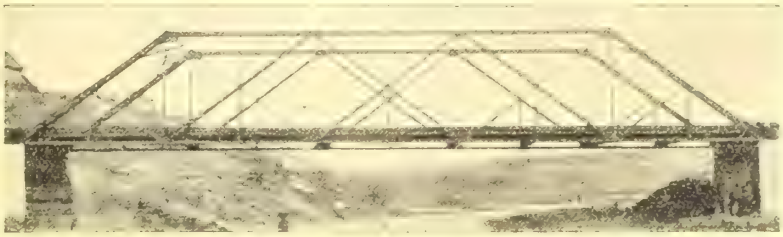
The Hamilton Bridge Works Co., Ltd.

Established 40 Years
Office, HAMILTON CANADA
Capacity 25,000 Tons per annum

Bridges
and
Buildings

Producing Engineers
and Contractors



All kinds of
Structural Steel and Bridge Work
Send for Estimate

Steel Plate and Structural Work
of every description

MacKinnon, Holmes & Co.
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Civil and Mechanical Engineers,
Manufacturers, Contractors.

Head Office and Works:
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The
Phœnix Bridge & Iron Works
MONTREAL Limited

General Steel Contractors
Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

Steel Bridge Contractors
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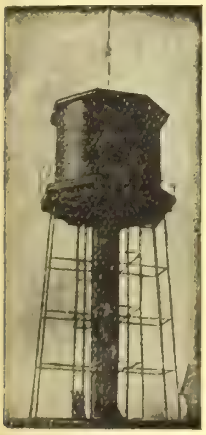
SPECIFICATIONS SOLICITED
Corbet Foundry & Machine Co., Owen Sound, Ont.



Steel and Wood **TANKS**

Suitable for Sprinkler Systems
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Steel Substructures of all kinds
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Windmills, Gasoline Engines,
Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

Jamieson Lime Company
Renfrew, Ont.
White Lime, Stone, Grey Lime, Brick, Drain Tile.

THE WARMEST SHEATHING WIND AND FROST PROOF

Not a mere felt or paper but a [illegible] bird's feathers do. [illegible] and one-half cheaper than back plaster. [illegible] pays for itself in two winters by saving coal. [illegible]

CABOTS' SHEATHING QUILT

SAMUEL CABOT, Inc., Sole Mnfrs., Boston, Mass., U. S. A.

Canadian Agents
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A. Muirhead Co., Toronto [illegible]
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International Varnish Co.
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Manufacturers of Highest Grade

Architectural VARNISHES

Branch of Standard Varnish Works
New York Chicago London Berlin Brussels

"Galvaduct" and
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For Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U.S. Letters Patent.
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It's Your First Order We're After
You'll be after us with your future orders because our
BUILDERS' SUPPLIES
always satisfy our customers and our standard of quality never varies.
Building and Crushed Stone, Lime, Cement, Fire Clay Plaster, Fire Brick, Hair, Sewer Pipe, Weeping Tile.
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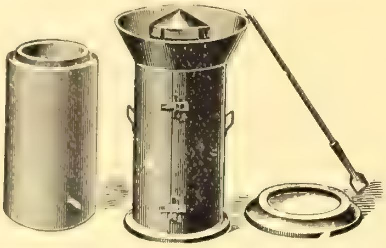
Britnell & Co., Limited
C. P. R. Yonge St. Crossing, Toronto
Office Phone North 664 665 Evenings North 2107

Robinson's
Patent Tile Moulds



For Making Concrete Culvert Pipe

The cut shows complete mould with cone top filler, also a culvert pipe just finished, showing the bottom ring. **No one can deny** the fact that cement culvert pipe properly made and laid will outwear all other constructed culverts whether made of wood or steel. Wood will rot, steel will rust, but cement will neither rot nor rust, but improve with age.

For Price of Moulds Write

Climax Road Machine Co.
Hamilton, Ontario

Globe Furniture Co., Limited

Our factory is the Most Complete and Modern in Canada for the manufacture of

Fine Hardwood Interior Finish

We are furnishing the Interior Trim for a large percentage of the best Residences, Banks, Churches and other Public Buildings in the country. We also contract for all Carpentry Work. We maintain a high standard of workmanship and material. By specifying our high-grade Fittings, Architects and Contractors are sure of completing the work with satisfaction to themselves and the owner. A million feet of Thoroughly Seasoned Hardwoods always in stock.

Send Plans and Specifications for Estimates

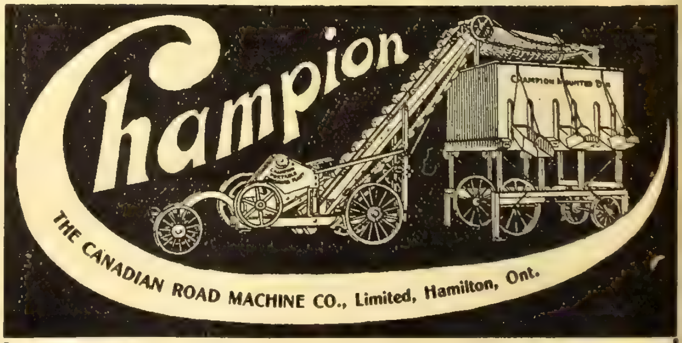
The
Globe Furniture Co., Limited
Toronto Office: 90 Yonge St.
Phone Main 5944
Main Office and Factory: Walkerville, Ont.

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus
MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name, W. E. Seagrave, guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor-Driven Vehicles of all kinds, our Latest Production.


Champion
THE CANADIAN ROAD MACHINE CO., Limited, Hamilton, Ont.
CHAMPION MOUNTED BIN

The cost of crushing depends on the durability and efficiency of the machine. We would like to submit proofs to convince you that the **Champion Crusher** will do more work and last longer than any other machine made. Catalogue is free.

High Class

Cement Stone

Equal to natural stone in Appearance
and Durability at a much lower price

Write Us for Particulars

The Cement Products Co.

Union Bank Chambers, 19 Wellington St. West

Phone M. 3056 **TORONTO, ONT.**

Sackville Freestone Co.

Sackville, N. B.

**Block Stone Shoddy
Dimension**

We have the most up-to-date Stone Sawing Plant owned by any quarry in Canada, and are prepared to undertake orders of any size, and our formation of Rock is the best.

Write us, and we will have our Toronto, Montreal, Ottawa or Quebec agent come to see you.

PORTLAND CEMENT

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Fire Bricks

Fire Clay

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STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

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Dundas Stone

All Sizes—For Concrete Road-work
and Sidewalks.

Doolittle & Wilcox, Limited

Dundas - Ontario

Corinthian Stone

is made of **stone** ; **is** of the **same material** from **face** to **back** ; **can** be **cut** or **carved** similar to natural stone ; is **specified** by **leading Architects**. **For prices** for all kinds of Ornamental Work, Sills, Heads, Ashler, etc., write

THE CORINTHIAN STONE CO.

Who are the Sole Manufacturers of "Corinthian Stone"

Office and Works - - **G.T.R. Junction, Guelph, Canada**

"Judge a Cement by its Works."

Sold under a **guarantee** other portlands cannot make in **good faith**. That guarantee is backed by the **oldest** and most **responsible manufacturers in the world.**

AMERICAN

CEMENT
ALSEN
45 BROADWAY, NEW YORK.

Selected for **PANAMA CANAL** in Preference at Equal Prices and has exceeded those severe requirements.

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Alsen's has now been awarded the largest contract ever let for one brand of cement which specifies 1,100,000 barrels of Portland, the Ashokan Dam, New York State.

The best color and most durable for cement blocks and sidewalks.

Write for list of other important works in all sections [illegible]

MEANS

Strength, Durability and Efficiency

All sizes 3 inches to 36 inches single and double strength

Write for catalogue "C" showing our range of **Sewer Pipe, Fire Brick, Wall Coping, Flue Liners, Chimney Tops.**

We quote F. O. B. your town.

The
Toronto Pottery Co., Limited
TORONTO, CANADA
Canadian Branch of the Robinson Clay Product Co., Akron, O.

SWANSEA
Salt Glazed and Vitrified SEWER PIPES

True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Sewer and Culvert Pipes

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and **New Glasgow, N.S.**

American Sewer Pipe Co.

Pittsburg, Pa., U.S.A.

LARGEST MANUFACTURERS OF

Glazed Earthenware

in the world.

Sewer Pipe

Single and Double. Strength, 3″ to 36″

Clay Conduits

Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

All the Knowledge and Skill of good Pipe Making for Half a Century are back of

Established 1860
Large Flanges

Not necessary to chip
HAMILTON PIPE
in making connections.

Hamilton Pipe

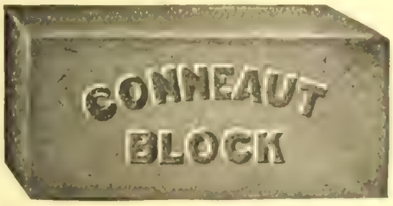
Can you ask for any stronger assurance of High Quality. Our reputation is established among the leading engineers and largest dealers throughout Canada.

BE SURE AND SPECIFY OUR PRODUCT

The Hamilton & Toronto Sewer Pipe Co., Limited
Hamilton and Toronto

We Pave the Way

for superior roadway construction.



Efficiency, Durability and Economy are strong features of Conneaut Paving Block.

Our situation insures foremost shipping facilities to all Canadian Points.

United Brick Co.

General Office: GREENSBURG, PA.
Works: CONNEAUT, OHIO

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

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Civil Engineer
Specialty
Municipal Engineering Works
Temporary Office, Mail Building, **TORONTO**
Winnipeg - Saskatoon

A. LEOFRED
(Graduate of Laval and McGill)
Civil Engineer
Specialty: **Waterworks**
39 St. John St., QUEBEC Telephone Bell 545.

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WATER WORKS, SEWAGE
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GALT - ONTARIO
Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, for foundation work..	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from ....$80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b. with 30 and 5 per cent. off for wholesale:—

	Star	D.D.
10 to 25 united inches.........	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7.25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, any color, ¾-in. square, 1-in. hex. and 3-16-in. round, 35 cents per square foot up.
Floor Tile—½-inch square, 45 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 3 x 2 inch; colors, buff, grey, granite, red granite, 35 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish, colors, firsts, 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G. cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
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Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

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Furnaces, 45 per cent.; registers, 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.; other specials, 40 per cent.

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¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 70; malleable bushings, 67½; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 67½ per cent.

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Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

J. E. [illegible] & [illegible], contractors, Ste. Agathe, Que., have dissolved.

The B. C. Gazette gives notice of the incorporation of the following companies: Cedar Cove Sash & Door Company, Limited, capital [illegible] [illegible] on Hardware Company, Limited, capital $25,000; Western Coal & Iron Corporation, Limited, capital $3,000,000.

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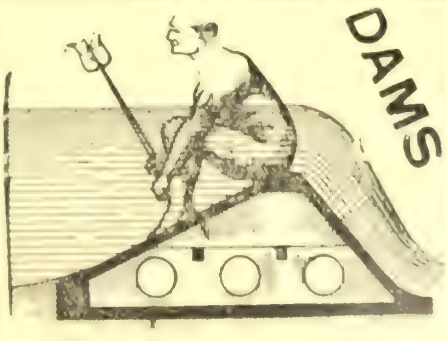

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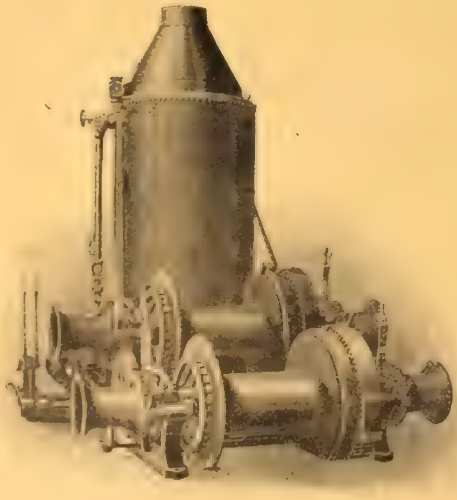

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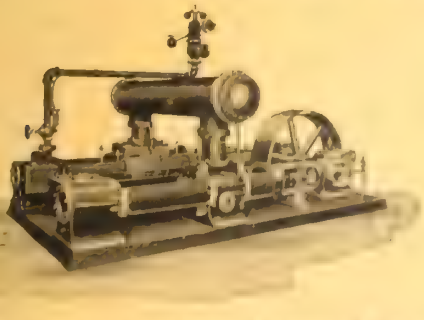

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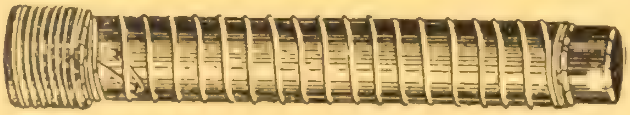

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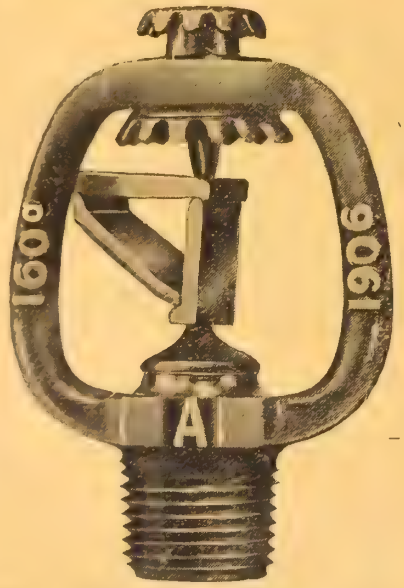

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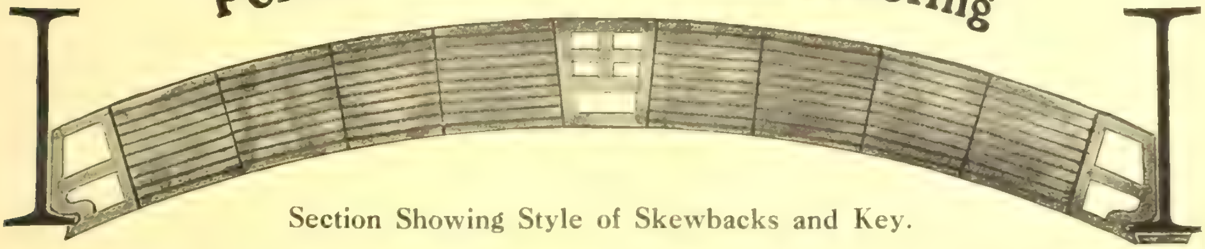

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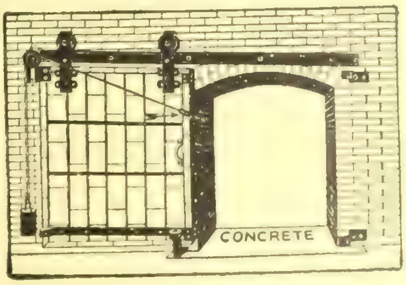

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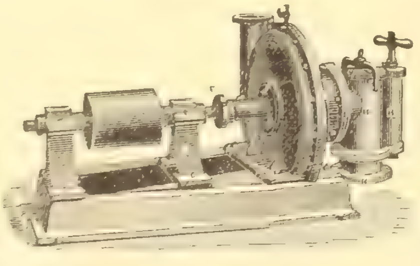

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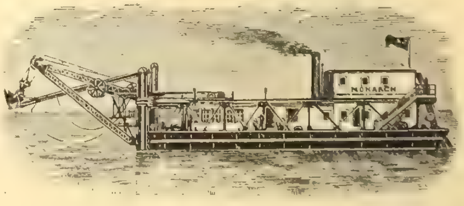

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to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

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"I cannot doubt but that the manner in which the defendant has offered its goods to the public, advertised them —the similarity of the labels; similarity of combination in catalogue, the use of the word 'STANDARD,' were fitted to deceive the public, and are proved, in some instances to have deceived the public. Nor can I doubt that such deception was the object kept in view by the defendants' manager." — Extract from Hon. Mr. Justice Archibald's judgment in recent suit of the Standard Sanitary Mfg. Co., Pittsburg, Pa., against the Standard Ideal Co., Port Hope, Ont.

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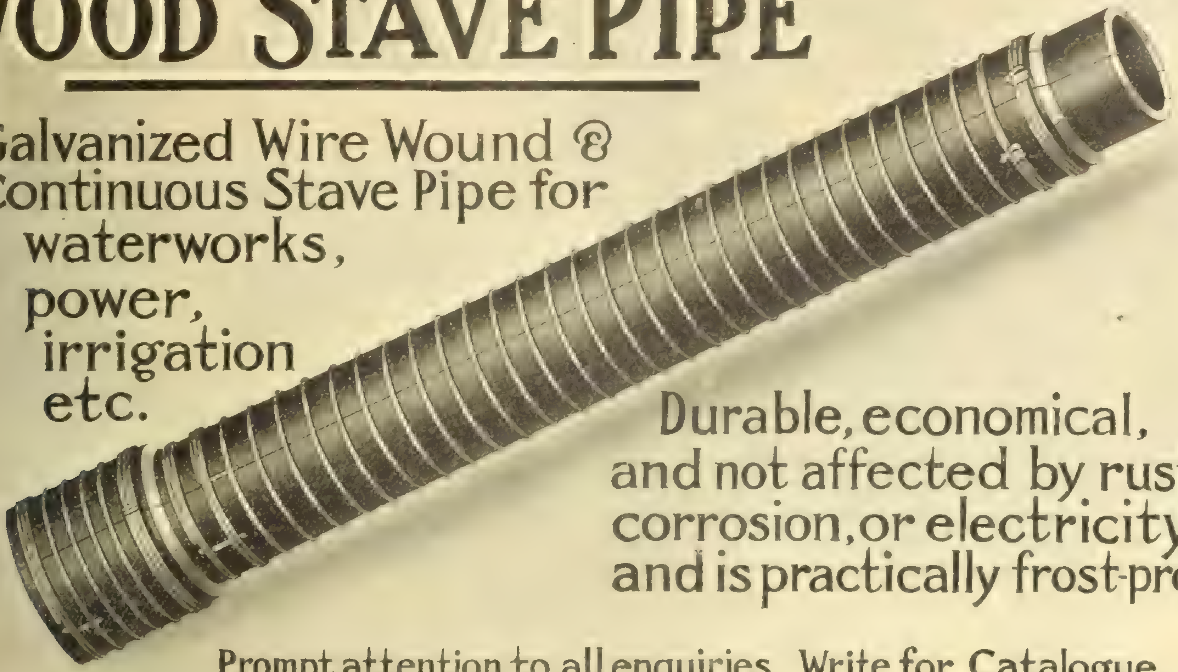
Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.



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Simple in Operation

Made in sizes to meet all requirements.

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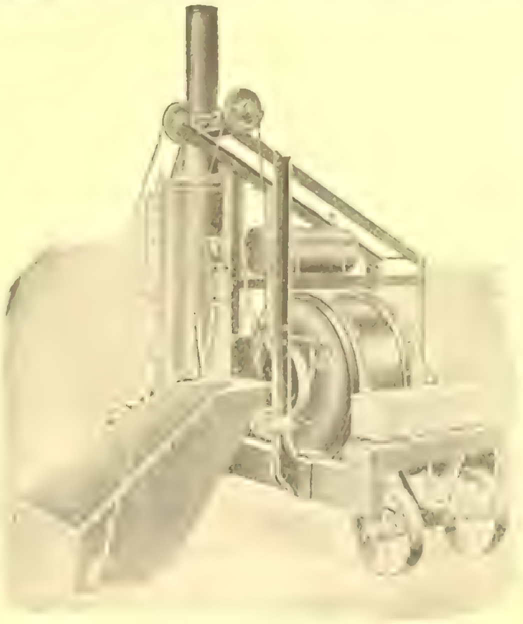

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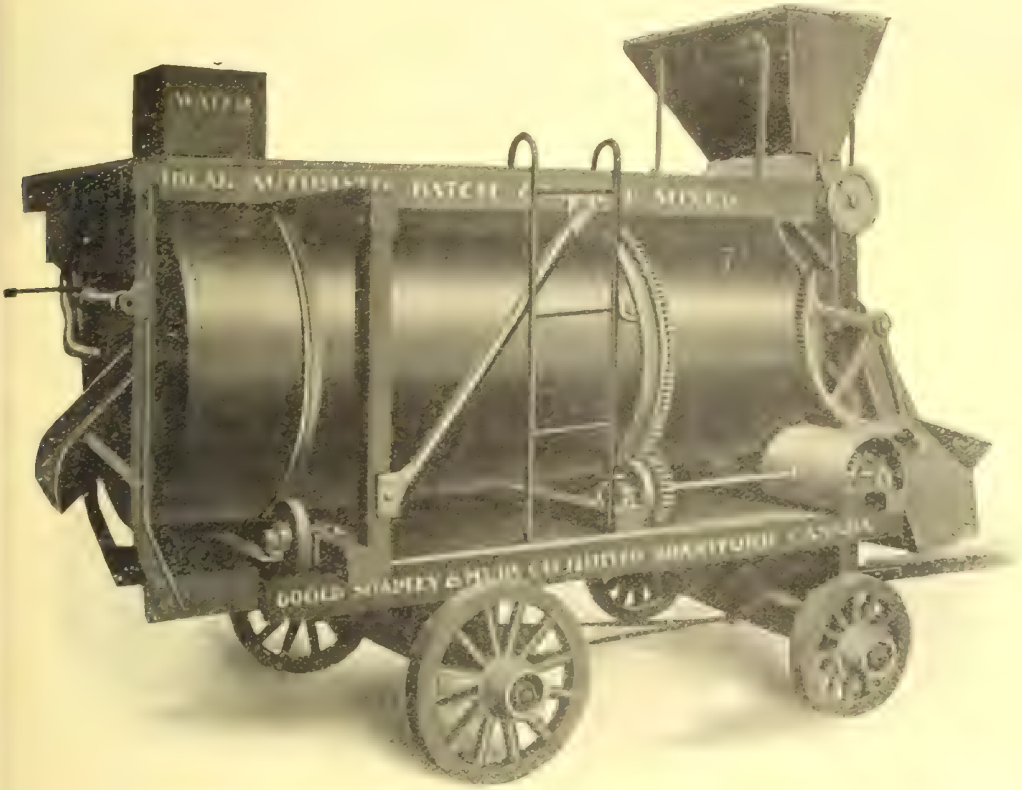

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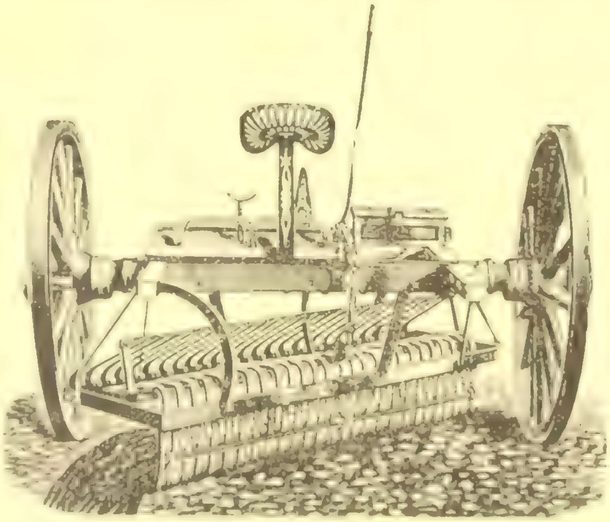

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You'll be after us with your future orders because our

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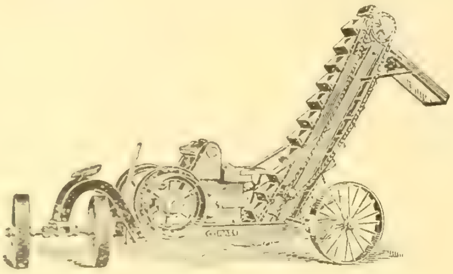
for Contractors, Townships and City Use



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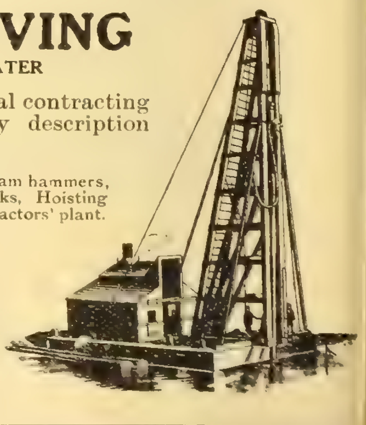

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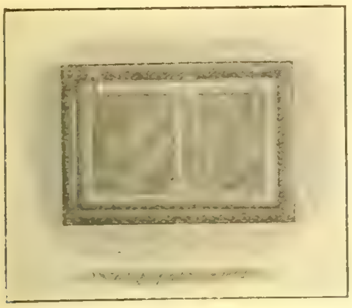

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MODEL COAL CHUTE

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Our flooring is thoroughly **air-seasoned** and **kiln-dried, end matched,** and **bundled.**

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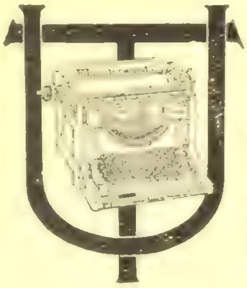

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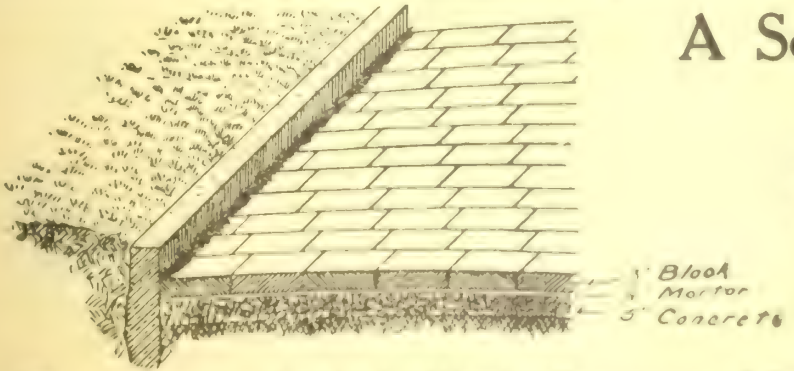

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Durable and Non-Abrasive.
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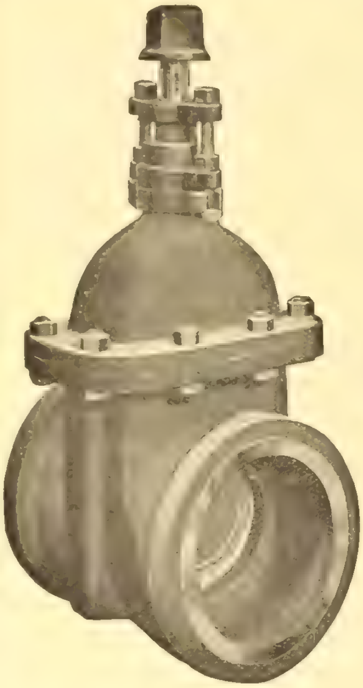

Valves
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Boxes
Hydrants

We make a specialty of supplying cities and towns with waterworks equipment.

Our products are all accurately manufactured of the best brass and iron.

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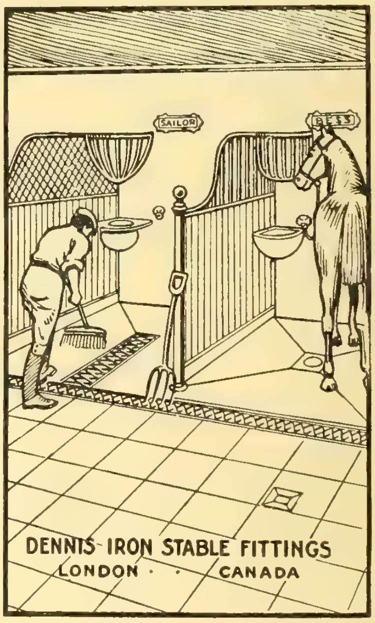
Hydrant and Valve Manufacturers
WALKERVILLE, Ontario

The Modern Stable



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We make a special feature of this line and quote prices that make it possible to furnish a stable in a complete and up-to-date way at a very moderate cost.

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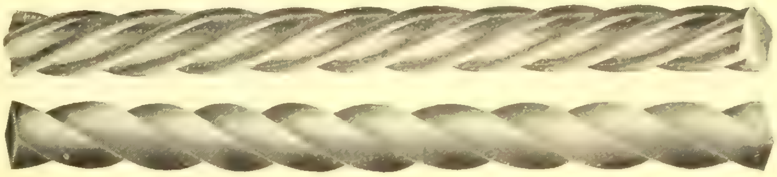

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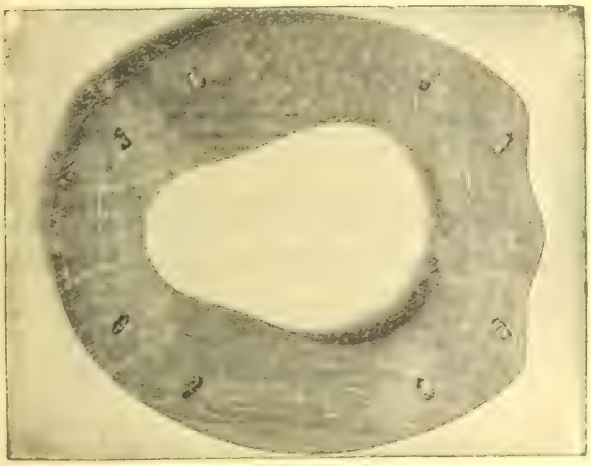
The superiority of this seat over all others is so evident, architects and builders who have their reputation and clients' interests at heart should specify and insist on the "Never Split" seat being a part of every closet combination they install.



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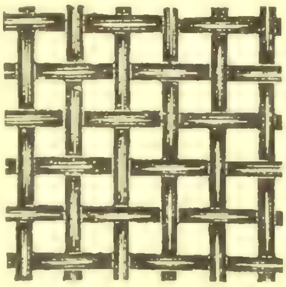
Hamilton



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Double Crimped Wire Cloth and Wire Screening

for all purposes of Steel, Iron, Brass, Copper, Bronze, Galvanized and Tinned Wire, etc.

There is no kind of Wire Fabric required in the production of any machine or manufactured article that we cannot furnish.

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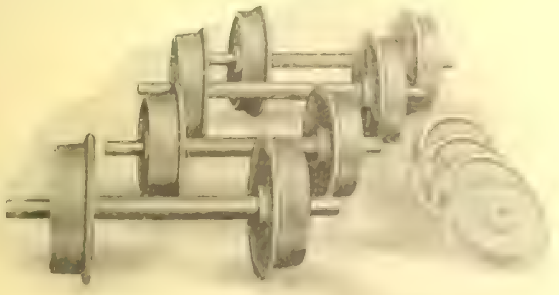

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Our prices will interest you.

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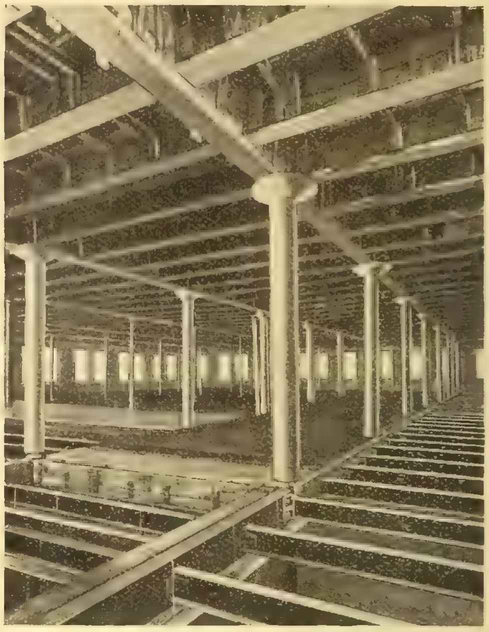
Works: Port Credit, Ont.

Reinforced Concrete
and Fireproof Construction



Showing work done by us at building of T. Eaton Co., Ltd., Toronto

We are contractors for construction work of all kinds and invite architects, Engineers, etc. to send us their specifications.

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Dry Pressed Brick

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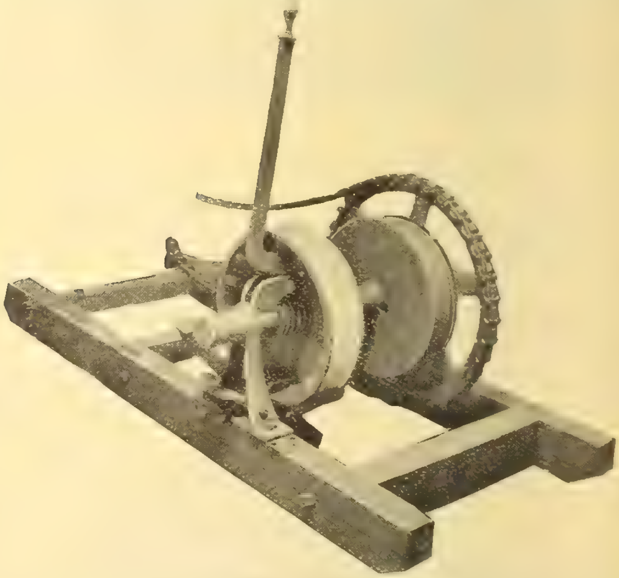
If you are interested in Hoists study this one



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This machine fills the long felt want for a strong, compact hoist at a moderate price. There are dozens of uses to which it may be applied by contractors, etc. Also Gasoline Engine, 1½ to 40 H.P.

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Engineers and Machinists **London, Canada**

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Contractors for
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¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
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Head Office : **34 Yonge Street, TORONTO**

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It is as genuine stone as manufactured ice is genuine ice. Made from pure white marble with a combination of minerals and everlasting Portland Cement.

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Scotch Derricks

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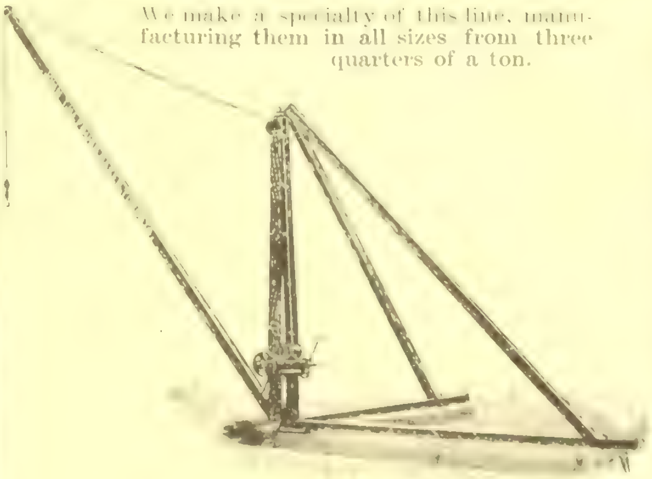

Our derricks have single and double purchase gears, hand brake and as much heaving rope as will reach the ground.

Write us for particulars about the Little Wonder Cement Block Machine and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds

Prices on application

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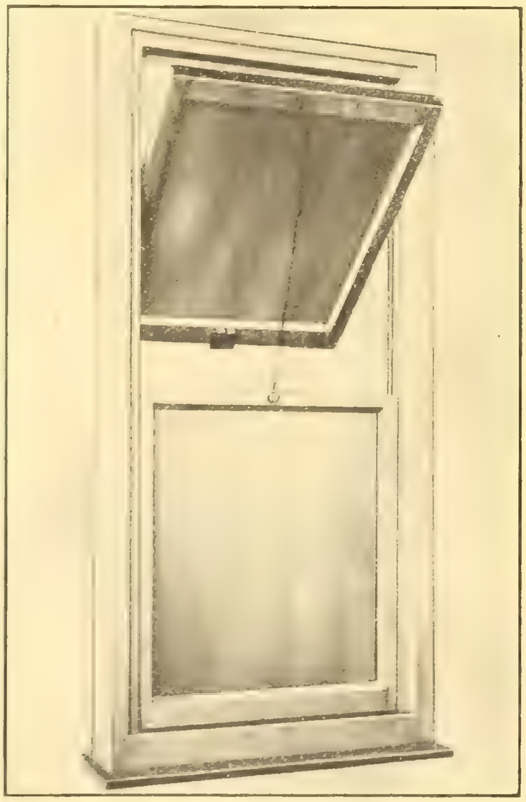

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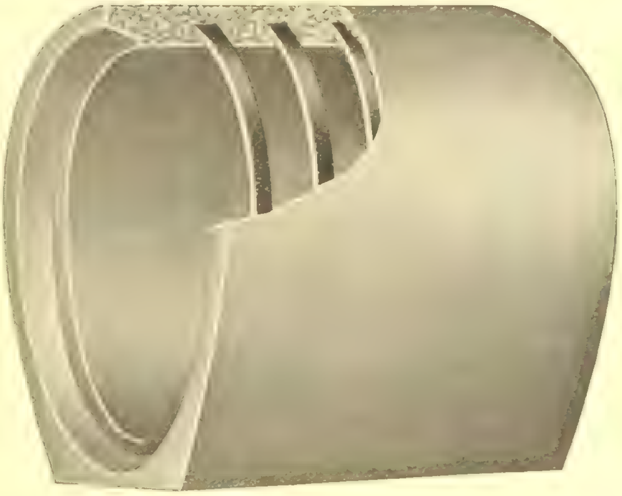
Branch Office and Factory, MONTREAL, P. Q.

Railway Engineers and Contractors



Timber culverts rot, clay pipe culverts break from frost or weight, metallic culverts rust and are woefully dear, CONCRETE CULVERTS LAST FOREVER and the price is relatively low.

The only absolutely **durable and frost-proof** culvert pipe is

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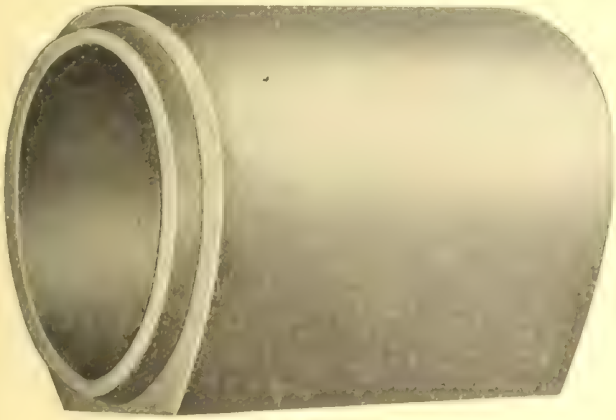

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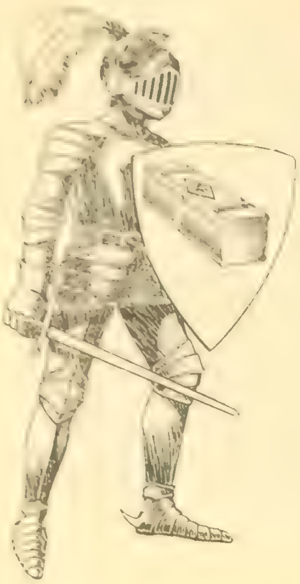

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Absolutely no re-rolled metal is used by US. This is not a knock at competition, as it is pretty well known in the building trades that many mills **do use** re-rolled metal.

Consider, then, only the brand "NF" on the bar when making up specifications, and you will be safe.

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Toronto, Ont., Canada

We Manufacture

Frames - Sash - Doors

House Trim

Finest Quality Hardwood Flooring
High Class Interior Work :: ::

OUR ARGUMENTS FOR SOLICITING YOUR BUSINESS ARE EXCELLENT.

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity.
New and well equipped factory with latest and best machinery.
Experienced workmen under the most expert supervision. ::

GIVE US A TRIAL ORDER OUR WORK WILL CONVINCE YOU 12

Georgian Bay Shook Mills, Limited

Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Atwood, Ont.

Tenders addressed to Geo. Lochhead, clerk of Elma, will be received until April 2nd for the construction of a drain in the township of Elma. Plans, etc., at office of the above.

Brandon, Man.

Tenders are being called until April 1st for waterworks supplies, etc. R. E. Speakman, city engineer. For further information see advertisement in this issue.

Chatham, Ont.

The following tenders were received for installation of a pump: McKeough & Trotter, $1,260; McKeough & Trotter, $1,388; Smart-Turner Company, $1,295; Canada Foundry Company, $1,390; John McDougall Caledonian Iron Works Company, $2,507; Park Bros., $1,402.50; Canadian Buffalo Forge Company, freight and duty extra, $833.50; Gardener Governor Company, duty extra, $1,100.

Cumberland, B.C.

M. Manson, M.P.P., is authority for the statement that the Government is preparing plans for the entire sewerage system.

Calgary, Alta.

The following complete list of tenders for cast iron pipes has been submitted by H. E. Gillis, city clerk:—National Iron Works, Toronto, 10 inch, $46.50 per ton, lake and rail. Jack & Company, Glasgow, 4 inch, $48,37; 6 inch, $46.10; 9 inch, $45.20; 16 inch, $44.75; specials, $71.20, f.o.b. Calgary. Canadian Equipment Company, Calgary, 4 inch, $49; 6 inch, $47.50; 8 inch, 47; 10 inch, $46.50; 16 inch, $45.50, f.o.b. Calgary. Evans, Coleman & Evans, Vancouver, 4 inch, $45.90; 6 inch, $44.29; 8 inch, $44.10; 10 inch, $43.75; 16 inch, $44.64; special, $78, f.o.b. Calgary. Stavely Coal & Iron Company, 4 inch, $46.40; 6 inch, $45.80; 8 inch, $45.25; 10 inch, $44.40; 16 inch, $44.10; special, $72.50, f.o.b. Calgary. Gartshore, Thomson Pipe Company, Hamilton, 8 inch, $46.50 per ton; specials, $57, f.o.b. Calgary. Canadian Iron Corporation Company, Montreal, 4 inch, $46.50; 6 inch, $45.40; 8 inch, $45; 10 inch, $45; 16 inch, $44.50; special, $67, f.o.b. Calgary. [illegible] inch, $26.64; 8 inch, $26.28; 10 inch, $25.80; 12 inch, $25.56; 16 inch, $25.92, f.o.b. Montreal. Canadian General Electric Company, Calgary, 4 inch, $47.10; 6 inch, $47.20; 8 inch, $46.70; 10 inch, $46.70; 16 inch, $46.20; specials, $64, f.o.b. Calgary. Total, 1,752 tons. Amount involved, $77,374.

Fort Erie, Ont.

The by-law to authorize the issue of debentures to the amount of $50,000 for the [illegible]

Tenders addressed to B. F. Matthews, town clerk, will be received until March [illegible] village. [illegible] Witmer & Brown, Fort Erie.

Guelph, Ont.

Tenders will be received by the City Clerk until April 2nd for the construction of approximately 15,000 square yards of pavement, etc. James Hutcheon, city engineer. For further information see advertisement in this issue.

Kingston, Ont.

Tenders have been taken for materials and labor necessary for laying a steel intake pipe. A. K. Kirkpatrick, engineer, Rockwood Hospital.

The Waterworks Committee will recommend that tenders for supplies be awarded as follows. Selby & Youlden, hydrants, etc.; Francis Tracy, steel drills, picks, etc.; Chadwick Bros., service cocks; Canada Foundry Company, valve, etc.; Gartshore, Thompson Pipe & Foundry Company, cast iron piping; Queen City Oil Company, oil; Simmons Bros., block tin, waste, etc.; W. B. Dalton & Sons, fire clay, shovels, etc.; McKelvey & Birch, lead piping, galvanized piping, fittings, etc.

Lockeport, N.S.

The ratepayers have authorized the council to borrow $3,000 for the providing of a free water supply.

London, Ont.

Tenders will be received until March 24th for the following supplies: Cement sidewalks, cement curb and gutter, lumber, hardware, iron castings, gravel, broken stone, corner irons, delivering broken stone, sewer pipe and cement, concrete pipe. A. O. Graydon, city engineer.

Moose Jaw, Sask.

Tenders ddressed to W. F. Heal, city clerk, will be received until April 11th for furnishing materials for and constructing pavement, combined curb and gutter and $116,500 feet of concrete sidewalk. Angus Smith, engineer.

Montreal, Que.

The Board of Control have asked for an appropriation for $10,000 to cover the cost of preparing plans and of preliminary work in connection with the establishment of a city filtration plant.

The Board of Control have under consideration the purchase of the property and plant of the Montreal Water & Power Company.

The Board of Control will be asked to [illegible] coming season to include all the suburbs annexed by the city within the past few years, and which are at present without a city supply.

Mr. William Lyall has outlined a scheme to the Board of Control which involves the [illegible] boulevard, stretching from the eastern [illegible] million dollar[illegible]

Mimico, Ont.

[illegible] will be received until April 4th for the construction and completion of a pipe sewer to connect with the New Toronto sewer system. Plans, etc., at office of the above or at the office of J. O. L. Macpherson, engineer-in-charge, Islington.

Nassagaweya, Ont.

The ratepayers will vote on a $10,000 drainage by-law.

North Battleford, Sask.

Tenders are being called by this municipality for pipes, hydrants, etc., in connection with the waterworks system. For further information see advertisement in this issue.

Ottawa, Ont.

The following tenders for pipe, etc., have been recommended by the Board of Control:—Vitrified clay pipe, T. S. Kirby & Company, 72 per cent. off list prices; stone sets, T. S. Kirby & Company, $65 and $75 per 1,000; stone sets, Dupuis & Fleming, $12,510; cement, H. Dupuis & Company, 45 1-2 cents cwt.; sand, L. Cousineau, 87 cents per cubic yard. The tenders recommended for acceptance by the waterworks committee are:—Hydrants and valves, Thos. Lawson & Sons, $2,962.50; castings, Thos. Lawson & Sons, $3.25 per cwt.; brass goods, James Robertson Company, Limited, $1,672.10; lead pipe, McKinley & Northwood, $1,527.60; iron pipe, Alex. Fleck, $8,901.50; oils and grease, Canadian Oil Company, $417. The case where the lowest tender was not accepted was that of John Coates, agent, but the committee gave the Fleck firm the preference because the pipe would be manufactured in Canada.

Quebec, Que.

This municipality is calling for tenders for annual supply of iron castings, brass castings, lead pipe and pige lead, cement brick and drain pipes. Jer. Gallagher, waterworks engineer.

Regina, Sask.

The engineers engaged to prepare plans for the sewerage scheme to cost $350,000 will shortly report. Mayor, R. H. Williams.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman, Board of Control, will be received until April 5th for the supply of 1,000 feet of rivetted steel pipe, seventy-two inches in diameter, and also 20 flexible joints. Specifications at office of City Engineer, and at B. 33 Board of Trade Buildng, [illegible]

Victoria, B.C.

G. H. Bryson, acting engineer, in his report on the reservoir advises that bids be [illegible]

Vancouver, B.C.

[illegible]

Westmount, Que.
By-laws authorizing a loan of $550,000 for municipal improvements, including [illegible] [illegible] etc., have passed the final reading in the council.

Wetaskiwin, Alta.
The by-law to raise $10,000 to complete the waterworks and sewers installation has been carried.

Waterloo, Ont.
The council has authorized the issue of debentures to raise the sum of $6,000 for improvements to waterworks.

Weyburn, Sask.
Tenders are being called under April 27th for pipelaying, pump house, etc., in connection with the waterworks system. For further information see advertisement in this issue.

Weston, Ont.
Tenders are being called by this municipality for pump house, mechanical water filters and electrically operated pumping machinery. For further information see advertisement in this issue.

AWARDED.

Chatham, Ont.
Park Brothers have been awarded the contract for waterworks supplies.

Calgary, Alta.
H. E. Gillis, city clerk, sends us the following list of accepted tenders for supplies for 1910; Canadian Brass Company, Galt, Ont., brass work for house services, lump sum, 2,357, f.o.b. Calgary. J. Robertson Company, Winnipeg, pipe lead, $5.50 per 100 lbs., f.o.b. Calgary; pig lead, $4.62 per 100 lbs., f.o.b. Calgary. Gurney Standard Metal Company, Calgary, Oakum, $3.75 per 100 lbs., f.o.b. Calgary. Crane & Ordway, galvanized iron pipe, bulk sum, $3,175, f.o.b. Calgary. Calgary Ironworks, Calgary, valve boxes, $4 per 100 lbs. Canadian Foundry Company, Toronto, crane posts, $54.10; specials, $3.20 per 100 lbs. Bissett & Loucks, Winnipeg, valves, $2,989.30 lump sum, f.o.b. Calgary. Calgary Iron Works, Calgary, hydrants, $50, all sizes, without crane attachment; made to sample. Union Iron Works, Calgary, hydrants, 8 feet, $49.50; 8 feet 6 inches, $50; 9 feet, $51.50 without crane attachment; with crane attachment, $5 extra; made to sample. Evans, Coleman, Evans, Vancouver, cast iron pipe.

Hull, Que.
Of the tenders for the new pumphouse, the lowest, Bisson & Sons, for $15,301, was accepted. Two others were received; one for $17,500 and one for $15,800.

London, Ont.
The following list of accepted tenders for supplies has been sent:—Brass work, London Brass Works Company, list, $905.75. Lead pipe, the Cowan Hardware Company, at $4.85. Stop cock boxes, the London Foundry Company, 1-2 inch at $1.35. Iron body street valves, the London Foundry Company, $6.75; $10.0; $18; 10 inch, $27.50. Iron castings, the Vulcan Company, at $2.65 per 100 lbs. Street hydrants, the Vulcan Company, 3-way, at $35.50. Hardware, the McLean Hardware Company. Miscellaneous supplies, the McLean Hardware Company. Portland Cement, W. Heaman & Son, at $1.59 bbl. Brass polish, A. McCormick & Son. Coal, the Lake Erie Coal Company, soft, $4. Oils (engine), Queen City Oil Company. Oil (cylinder, coal and grease), Canadian Oil Company. Lumber, the Dyment Baker Lumber Company. Pipe laying and iron pipe, Fred T. Harding. Bookbinding, H. P. Bock. Printing (general), Dawson Bros. Printing annual reports, Allinson & Heighway.

Victoria, B.C.
The committee recommended that the contract for paving blocks be awarded to the Michigan Puget Sound Lumber Company, the lowest tendered. G. H. Bryson, acting city engineer.

Railroads, Bridges and Wharves

Brockville, Ont.
Ratepayers have authorized an expenditure of $16,000 for the rebuilding of certain bridges in the municipality. Barber & Young, consulting engineers.

Calgary, Alta.
The C. P. R. management are calling for tenders until March 31st for construction of concrete work for various pieces of work in this division. Plans, etc., at office of assistant chief engineer, Winnipeg; division engineer, N. E. Brooks, Calgary; and resident engineers at Moose Jaw, Medicine Hat, and Cranbrook.

Fredericton, N.B.
Premier Hazen introduced in the Legislature a bill to aid in the construction of a railway down the St. John river valley to St. John.

Gravenhurst, Ont.
It is stated that Mr. W. F. Wasley is in Boston arranging for the building of a marine railway.

Minitonas, Man.
Tenders are being called by E. Wiemeyer, secretary-treasurer of this municipality, until March 30th for a ninety foot steel Pratt truss bridge. Plans to be seen at Department of Public Works, Winnipeg, or at the municipal offices.

Montreal, Que.
Plans concerning the disposal of the six million dollar Government loan to the Montreal Harbor Commissioners are expected to be made public within the course of two weeks.

New Westminster, B.C.
It is probable that the city will construct a new wharf at the foot of McInnis street. The engineer has drawn up plans providing for a warehouse 143 by 53 feet, where building material may be stored.

Port Arthur, Ont.
The Great Northern line from Orville, Wash, to Penticton, B.C., has been located. Forty miles of road may be built this year.

St. Thomas, Ont.
Tenders addressed to T. H. Holmes, Colinville, Ont., will be received until April 6th for the building of concrete abutments, etc., to bridge over Sydenham river, etc. For further particulars see advertisement in this issue.

Toronto, Ont.
The Temiskaming & Northern Ontario Railway Commission are calling for tenders until April 6th for works required in connection with construction of bridges. For further particulars see advertisement in this issue.

Vancouver, B.C.
C. A. Hannington, who is in charge of the Canadian Northern survey in Northern British Columbia, has succeeded in locating a line from the entire distince between Tete Jaune Cache and the Yellow Head Pass at the summit of the Rockies. He is now on the way out and is engaged revising a portion of last summer's survey near Cranberry Lake, in the summit between the North Thompson and Fraser rivers. The Canadian Northern now has a line located from New Westminster to Yellow Head Pass, 450 miles.

Winnipeg, Man.
Tenders are being called until March 28th for the construction of new freight car shops, six stall addition to Ignace engine house and several standard section houses and station buildings on the Central Division, C. P. R. Plans, etc., at office of the Division Engineer, Frank Lee, Winnipeg.

AWARDED.

Vancouver, B.C.
The contract for the construction of the Grand Trunk Pacific wharf at Vancouver has been awarded to C. J. Johnson & Company, Vancouver and Seattle.

J. N. Stewart & Son are reported to have secured contracts from the Vancouver, Victoria & Eastern Railway Company for construction of two sections of its line aggregating 18 and 51 miles of track.

Winnipeg, Man.
The recommendation of the city engineer to purchase railroad asphalt plant, capacity 1,800 square yards per day, from F. D. Cummer & Son, at $16,500 was accepted. Other tenders were: Alloway & Champion, six tenders on various types of plants, Bitulithic & Contracting Company, and H. P. Pennock & Company. Prices ranged from $15.700 to $23,100. Lowest tender was for a plant with capacity of only 1,000 yards daily.

Public Buildings, Churches, Schools, etc.

Assiniboia, Man.
On the 2nd April the ratepayers will vote on a by-law to raise $40,000 for school purposes. Frank Ness, St. Charles, clerk.

Battleford, Sask.
Tenders will be received until 31st March for the construction of buildings on the Indian Reserves: Thunderchild's Reserve, Battleford Agency, Moosomin's Reserve, Battleford Agency, Ready's Reserve, Duck Lake Agency. Plans may be seen at the following offices: Indian Agents at Battleford and Duck Lake, and for the offices of Dominion Lands at Prince Albert and Battleford, and on application to J. D. Maclean, Secretary Department of Indian Affairs, Ottawa, Ont.

Boissevain, Man.
The by-law to raise $12,000 for town hall, etc., was carried by the ratepayers.

Brantford, Ont.
The Separate School Board is calling for tenders for the erection of a new school here to cost about $18,000.

Carleton Place, Ont.
A joint stock company will be formed to build a rink of steel structure at an estimated cost of about $15,000.

Cote St. Paul, Que.
The erection of a new town hall for this municipality has been approved by the ratepayers. Estimated expenditure, $36,000.

Flesherton, Ont.
A continuation high school will be erected in the township of Artemesia for which debentures of $13,000 have been authorized.

Halifax, N.S.

Messrs. Harris & Horton, Keith building, are calling for tenders until April 6th for the construction and completion of a Young Men's Christian Association building to be erected here. Plans, etc., at office above. O. E. Smith, convener, building committee.

Hamilton, Ont.

The First Methodist Church are considering the erection of a new church to seat about 1,800 people.

Tenders addressed to J. W. Jardine, county clerk, will be received until March 23rd for the various trades, including tiling, plumbing and heating, fittings, etc., in the erection of registry office. Plans, etc., at the office of the architect, Mr. Stewart McPhie, 701 Bank of Hamilton Building.

Hanover, Ont.

The town council are having plans prepared for a public library and town hall. John Taylor, clerk.

Kildonan, Man.

The money by-law for issuing debentures for $11,000 for a new school was decisively defeated.

Kilowna, B.C.

It is reported that bids will be received until March 26 for the erection of the proposed church of St. Michael and All Angels. W. A. Peters, architects, Kelowna.

Kingston, Ont.

The plans for the new metallurgy building for the School of Mining, Queen's University, have been approved. The cost, $40,000, is covered by a gift.

It is estimated that the remodelling of the north wing of the municipal buildings and the installation of steam heating will cost $14,000. Wm. Neelands, architect, Ald. Graham, chairman, Property Committee.

Lachine, Que.

The city council are endeavoring to complete arrangements for the purchase of property on Eighteenth and Nineteenth avenues for the erection of an extensive combination city hall, fire and police station.

Leamington, Ont.

Tenders addressed to N. Tessier, secretary, Department of Public Works, Ottawa, will be received until April 4th for post office, customs and inland revenue fittings for this place. Plans, etc., on application to Mr. S. O. Roach, clerk of works, Leamington; T. A. Hastings, clerk of works, postal station F., Toronto, Ont., and at the above Department.

Lethbridge, Alta.

The congregation of St. Augustine [illegible] erect a new church. Estimated expenditure, $100,000.

London, Ont.

Plans for the new Masonic Temple are to be in by the 1st of April, when tenders will likely be called.

Talbot Street Baptist Church are considering advisability of selling the present church site, and the purchase of a new one.

Montreal, Que.

The Board of Protestant School Commissioners have purchased extensive building lots in Nun's Park, Point St. Charles, Que. These will be held for future school sites.

Eric Mann, architect, 30 St. John street, is preparing plans for additions and alterations to the Victoria Presbyterian [illegible] building at Point St. Charles.

The Federal Government have under consideration the erection of a new Catholic school building at this place, estimated cost, $10,000.

It is expected that the work of completing the new Catholic Church in Verdun will be commenced in the spring. Estimated cost, $100,000.

Nelson, B.C.

At the annual meeting of the Kootenay Lake Hospital Association the proposition for a modern hospital building was favorably considered. President Hamilton Byers; secretary, G. Johnstone.

Ottawa, Ont.

Tenders will be called shortly for the erection of the new departmental building on Sussex street.

Councillor W. R. Cummings, Reeve of Eastview, is authority for the statement that Carleton county will build the tuberculosis hospital, which was to have been built by the two counties, Renfrew and Carleton. Estimated cost, $30,000.

Prince Albert, Sask.

At a special meeting of the council, it was decided to make extensive alterations and improvements in the city hall, the cost of which will be about $7,000.

The Board of Trade has received a letter from the International Theatre Company, of Winnipeg, asking if suitable properties for a theatre can be secured here.

Rodney, Ont.

The council passed a $2,500 new town hall by-law.

Simcoe, Ont.

The new Lynwood skating rink was destroyed by fire on the 17th inst. Estimated loss, $12,000.

Southampton, Ont.

The by-law to expend $12,000 in the building of a new Town Hall here was carried.

St. John, N.B.

The committee appointed to investigate the need of a new school has recommended that a new building be erected in the vicinity of the Newman Street School. Mr. Bullock, chairman.

Tappen Siding, B.C.

Tenders addressed to the Minister of Public Works will be received until March 29th for the erection of a large one-room frame school building. Plans, etc., at office of the secretary of the school board, Kault, B.C., and at the Department of Public Works, Victoria, B.C.

Toronto, Ont.

Tenders for the construction of a school at Balmy Beach will be invited shortly. James Simpson, chairman, Board of Education.

Improvements and extensions to cost [illegible] and club house by the Toronto Lacrosse & Athletic Association. Geo. W. Gouinlock, Temple Building, architect.

Chief Justice Meredith has issued an or- [illegible]

Tenders addressed to [illegible] man, Board of Control, will be received [illegible] Architect, City Hall.

Vancouver, B.C.

Plans have been prepared by Architect Leach for the new offices of the board on the corner of Hamilton and Dunsmuir streets.

The Socialists have decided to buy a site and erect an auditorium in which they can hold their meetings. Nearly $20,000 has already been subscribed.

Victoria, B.C.

C. E. Watkins, architect, 606 Fort street, will prepare plans for the new high school to be erected, for which the ratepayers voted $150,000.

Welland, Ont.

The tenders for Welland Presbyterian church will have to be reconsidered, as a change had been made in the plans, which had become known to some and not to others. New tenders will be called. Estimated cost of improvement, $10,000.

Winnipeg, Man.

Central Congregational Church has purchased a $100,000 site at the corner of Kennedy and Ellice streets, and will build an edifice to accommodate 4,000.

It is stated that tenders will be called at once for the erection of the Lord Roberts school on Beresford avenue. Estimated expenditure, $80,000.

AWARDED.

Fonthill, Ont.

We are informed that P. S. Peacock, of Welland, has been awarded the contract of the masonry, plastering, carpentry, painting and glazing and metal work for the erection of Fonthill public school.

Montreal, Que.

The Board of Control have awarded the contract as follows for alterations to the council room. Painting, D. H. Scott, $475; brass railings, Garth & Company, $264.

The general contract for the construction of a new school building for the Board of Trustees, Rosemount, has been awarded to L. Beaudry. Mr. A. F. Dunlop, architect, Lindsay Building.

Mr. Jos. Sawyer, architect, 401 Guy street, has awarded the contract for the wiring and fixtures for the Plessis street school for the Catholic School Commissioners, to the N. Simoneau Electric Company, 583 Notre Dame street west, Montreal.

Portage la Prairie, Man.

The contract has been awarded for the erection of a new grand stand to cost $43,500 to D. Winton of this city, and the structure is to be completed by May 15.

Sudbury, Ont.

The Thornton-Smith Company, 11 King street west, Toronto, has been awarded the contract for the decoration of the fine new Presbyterian church.

Sydney, N.S.

The following tenders for the construction of the new fire station were received: Brick construction, (1) Rhodes, Curry & Company, Amherst, N.S., $13,400; (2) Chappell Bros. & Company, Limited, $14,755; (3) F. L. Dixon, $14,200; (4) A. Gil [illegible]

Toronto, Ont.

[illegible]

Montreal, Que.

The Montreal Underground and Elevated Railway Company are applying to the Quebec Legislature for a charter of incorporation. The concern is capitalized at [illegible].

A petition has been introduced at the Quebec Legislature for the incorporation of the Soulanges Power Company, with a capitalization of $1,000,000. The company propose to develop and sell electrical power in the Counties of Soulanges, Jacques Cartier, Laval and Hochelaga and in the City of Montreal. They also ask for permission to erect necessary transmission lines.

Winnipeg, Man.

The council awarded the contract for the equipment of the terminal station to the Canadian Westinghouse Company, $[illegible], and to Claydon Bros., the contract for the erection of terminal station, $[illegible]. Noted in issues of March 16th and 9th.

Residences

Hamilton, Ont.

The following building permits have been issued: Charles Widdup, six brick houses on Stirton avenue, between King and Wilson streets, $6,000; Thomas Stephenson, brick house on Charlton avenue and Kent streets, $2,000; Robins, Limited, five frame houses in Kenilworth, $3,400.

Montreal, Que.

Mr. Dalbe Viau, architect, 76 St. Gabriel street, is preparing plans for two stores and two dwellings to be erected at La Tuque, Que., for Mr. George Boussly.

North Bay, Ont.

Plans have been prepared for His Lordship Bishop Scollard, by H. W. Angus, architect, for a residence adjoining the Church of St. Mary's-on-the-Lake, and facing McIntyre street west. Estimated cost, $25,000.

Outremont, Que.

Recent building permits include the following: P. O. Cassarent, 140 Bloomfield street, dwelling, Bloomfield street, $4,000; J. Z. Gauthier, 504 Sherbrooke street east, residence on Bloomfield street, $5,500; F. Gabiere, 938a Drolet street, residence on Bloomfield street, cost $5,000; J. L. Tremblay, 2432 Park avenue, twelve flats to be erected on Hutchison street, $12,800; J. D. Langevine, 2366 Park avenue, flats on Fairmount avenue, cost $10,000; David Abel, 137 Knox street, Montreal, residence on Rockland avenue, cost $5,000. Building inspector, H. C. Reid.

Winnipeg, Man.

The apartment block to be erected between Ellen and Dagmar streets will be of pressed brick and cut stone construction, four storeys high. Contracts have been awarded for the excavation. W. W. Blair, Northern Bank Building, architect. Noted in issue of February 2nd.

AWARDED.

Montreal, Que.

Messrs. Ogilvy & Mitchell, architects, 127 Stanley street, have awarded the general contract for the erection of a residence corner of Sherbrooke street and Elm avenue for Mr. John Ogilvy, to Messrs. Bernard & Fils, contractors.

Waterloo, Ont.

Mr. Gledhill has let the contract for the construction of five houses to Messrs. Hurst & White. S. H. Lambert will supply the material.

Business Buildings and Industrial Plants

Brandon, Man.

The International Harvester Company has applied for suitable track frontage for their proposed $75,000 warehouse.

Burgessville, Ont.

The store owned by W. Kirkpatrick was destroyed by fire on the 19th inst. Total estimated loss, $6,000.

Collingwood, Ont.

The store of David C. Fields was damaged by fire on the 15th inst. Estimated total loss, $9,000.

Messrs. C. Stephens Company, Limited, will erect a large building, 35 x 80 feet, two storeys high with basement. Plans have been prepared by Mr. John Wilson.

Dartmouth, N.S.

The Christie Fish Company have submitted a proposition to the Board of Trade for the establishment of a cold storage plant here. President of Board of Trade, C. E. Creighton.

Elk Lake, Ont.

Buildings to the value of $50,000 were destroyed by fire on the 15th inst.

Hanover, Ont.

The Knechtel Furniture Company, Limited, called for tenders on the 18th inst. for their 5 storey reinforced concrete building.

Kenora, Ont.

The Royal Canadian Four Mills Company, recently organized, will erect a large plant.

The Tourist Hotel Company, Limited, have appointed a committee to make arrangements to commence work on the completion of the new building at once.

Kingston, Ont.

The N. C. Polson Company are having plans prepared for a concrete factory and warehouse building, 100 feet by 60 feet.

Lachine, Que.

At a recent meeting of the City council a deputation was appointed to interview the management of the Grand Trunk Railway Company to urge the advisability of erecting a station building in the centre of the municipality, to be known as the "Lachine Station."

London, Ont.

White & Sons have a building permit for a cement plant to cost $40,000, and an office to cost $10,000.

Montreal, Que.

Tenders for the construction of the new Windsor street station viaducts will be received up to Saturday, March 26th. W. S. Painter, architect, Windsor street station.

The Salada Tea Company, head office, 32 Yonge street, have purchased the cut stone building, corner St. Paul and St. Sulpiece streets on which they will make alterations and probably additions.

Plans are being prepared for extensive alterations to the Alliance National Building, corner of Labelle Lane and Viger street. Mr. Dalbe Viau, architect, 78 St. Gabriel street.

Geo. W. Reed & Company, Limited, have secured additional property on St. Antoine street, adjoining their present factory, and will erect a three storey office building on this site. The structure will have an ornamental metal finish and will be fireproofed throughout. The company also intend to erect an addition to their present factory, 125 feet by 50 feet in extent. Messrs. Hutchison, Wood & Miller, architects, Royal Insurance Building, are preparing the plans.

The Montreal City and District Savings Bank have completed the purchase of a tenement house, corner Park avenue and Laurier avenue, in the Annex, which will be remodelled for banking purposes. Mr. A. H. Lapierre, architect, 21 Street Railway Building, is at present preparing plans for the extension and alterations.

Morrisburg, Ont.

Permission has been granted to the assignee of the Canadian Sheet Steel Corporation to make alterations in the power plant in accordance with the plans submitted by Henry Holgate, consulting engineer, Montreal, thus permitting the company to erect another mill.

McAdam Junction, N.B.

The C. P. R. will commence work immediately upon a large addition to the station here.

Nelson, B.C.

Kootenay Jam Company, which erected a factory last summer, intends to put a new storey on the building.

Newmarket, Ont.

The by-law in favor of granting five thousand dollars to the Office Specialty Manufacturing Company was carried. This company purpose erecting an $80,000 addition to the present factory this summer.

New Westminster, B.C.

The National Paper Mills Company, a Vancouver and Victoria concern, is negotiating for a site near the Fraser Mills, where it is proposed to establish an industry.

North Vancouver, B.C.

Burns & Walkem, it is stated, have purchased the property between St. Andrews and St. Patrick running through to Second street, on which a tourist hotel will be erected.

Outlook, Sask.

The buildings occupied by G. W. Druggist, Fraser Bros.' hardware and others were destroyed by fire on the 20th inst. Estimated total loss, $80,000.

Port Arthur, Ont.

The Port Arthur Independent Order of Foresters is planning to erect a 5 storey brick business block on St. Paul and Van Norman streets.

Mayor Matthews is authority for the statement that the new shipbuilding yards will be established here by the Western Shipbuilding & Dry Dock Company, branch of the American Shipbuilding & Dry Dock Company. Estimated expenditure $1,600,000.

Shoal Lake, Man.

The Farmers' Trading Company's building was destroyed by fire recently. Estimated loss, $9,000.

St. John, N.B.

The proposition to give a free site and special tax and water rate concessions to Frederick C. Durant, of Philadelphia, representing the Atlantic Sugar Refinery Company, Limited, has been formally ratified. Mr. Durant guarantees to erect a sugar refinery in St. John to cost $2,000,000. Noted in previous issues.

H. L. McGowan is authority for the statement that work on the David Craig Company's plant (mentioned previously) will be started early in May.

Toronto, Ont.

The foundry of the Don Iron Works Company, Ashbridge's Marsh, was destroyed by fire on the 19th inst.

The premises of William Coulter & Son, 155 George street, were damaged to the extent of about $5,000.

The T. Eaton Company have taken out a building permit for their 5 storey brick and steel store at 6-8 Queen street west, $57,000.

Rumor credits the C. P. R. with being the purchaser of the two blocks of real estate at the corner of Yonge and Carlton streets. Nothing definite is yet known as to plans.

Truro, N.S.

At the annual meeting of Stanfields, Limited, it was decided to erect another large building this year. Mr. Dougall Henderson has plans prepared for a building, 53 x 163 feet, to cost $50,000. Work will be commenced shortly.

Vancouver, B.C.

A Vancouver syndicate, headed by F. L. Buckley, has purchased 1,300 feet of water frontage on Lulu Island, and announce their intention of putting a lumber mill on the property this spring.

Thomas Hooper, architect, 739 Hastings street, has plans prepared for a 12 storey building, 104 x 120 feet, for the Dominion Stock & Bond Corporation of Vancouver, capital $2,000,000. Estimated expenditure, $600,000. President, Hon. Price Ellison, Minister of Lands; managing director, George H. Salmon.

Victoria, B.C.

The Union Bank of Canada has opened up a branch in this city, occupying temporary quarters at present. Ultimately a business site will be secured and a fine building erected.

Waterloo, Ont.

The premises of Valentine & Martin, shoe manufacturers, were destroyed by fire on the 18th inst. Total estimated loss, $30,000.

Welland, Ont.

The Welland Glass Manufacturing Company have two sites under option, on one of which it is announced four steel buildings will be built at a cost of $75,000. E. A. Fultz, Cleveland, Ohio, Willis L. Adams, electrical engineer, Niagara Falls, N.Y., and G. C. Brown, this place, are directors.

Weyburn, Sask.

Cameron & Heap, wholesale [illegible] Fort William, Kenora and Regina, have acquired the property southeast of the C. P. R. station, on which they will immediately erect a large distributing warehouse. R. M. Alexander, local manager.

Winnipeg, Man.

S. Hunaecal will erect [illegible] plant on Higgins avenue. [illegible] cost, $80,000.

The lumber yard of the Graham [illegible] Door Company with a small warehouse were damaged on the 13th inst. by fire to the extent of about $30,000.

Tenders are being called by the Vulcan Iron Works until March 31st for the erection of a brick and stone block [illegible] Plans, etc., at Builders' Exchange.

It is the intention of the Manitoba Cold Storage Company to add [illegible] storeys to their present building to cost [illegible] The new [illegible] will [illegible] 000. S. H. MacColl, manager.

The Provincial Legislature will be [illegible] to authorize the [illegible] to the extent of two million dollars for the establishment of a system of elevators. The Legislature will also be asked for a grant of fifty thousand dollars for preliminary operating expenses.

AWARDED.

Comox, B.C.

W. K. Gilley has been awarded the contract for the supplying of the pile foundation for the three and one-half miles of railway being constructed by the Fraser River Lumber Company. Estimated quantity required, about 3,000,000.

Edmonton, Alta.

The contract for the new Molsons Bank building to be erected on Jasper avenue has been awarded to J. Dunlop at a figure close to the fifty thousand dollar mark. The building will be a three storey structure, fireproof, of concrete and stone. H. A. Magoon, architect.

Fort William, Ont.

The contract for the construction of the brick block being erected for Mr. P. J. Rochon, corner of Myles and North streets, has been awarded to A. P. Rochon.

Hamilton, Ont.

The contracts for the erection of the steel building for the Sawyer-Massey Company have been awarded as follows:—Structural steel, Hamilton Bridge Works; mason work, George C. Mills; roofing, Thos. Irwin & Son.

Montreal, Que.

The W. W. Scott Company, Limited, have been awarded the contract for installation of fixtures and fittings for the Cafe Bouillon in the new Banque Nationale. Alphonse Piche, architect, 52 Victoria Square.

Messrs. Simpson & Peel, contractors, have been awarded the contract for the construction of offices on the eighth floor of the Mark Fisher Building. Alphonse Piche, architect, 52 Victoria Square.

Mr. Alphonse Venne, architect, 15 St. Lawrence boulevard, has awarded the contract for the erection of flats containing twelve apartments and three stores for Mr. Wilfrid Bessette, to be erected corner Esplanade and Bernard streets, to Arsene Frenette, general contractor, 212 Fabre street.

Mr. Dalbe Viau, architect, 76 St. Gabriel street, is preparing plans and specifications for six dwellings on Esplanade avenue and six dwellings on St. Urbain street for Messrs. Dobrofsky & Rosenburg.

Plans are being prepared for the erection of six dwellings on Cadieux street near Prince Arthur street for Mr. Dobrofsky. Mr. Dalbe Viau, architect, 76 St. Gabriel street.

Orillia, Ont.

The contract for the Long Manufacturing Company's plant has been awarded to [illegible] to be completed on the 15th of July. Foundations were laid in the fall.

Power Plants, Electricity and Telephones

Brandon, Man.

[illegible] operated in the city, and to hand over the same to a company to operate. Mayor [illegible]

Calgary, Alta.

[illegible] tion to the city council respecting the construction of an electric railway from Calgary to Chestermere Lake. No decision has been reached.

Works Board have recommended that 200 meters of various sizes be contracted for with the Canadian General Electric Company, Toronto, for the coming year; also that 200 five ampere meters or over be contracted for with the Northwest Electric Company, and necessary polyphase meters.

Guelph, Ont.

The Ontario Government have granted permission to the People's Railway for the proposed extensions to Wellesley and New Dundee and construction work will commence early this spring. A. N. Warfield, chief engineer.

Hull, Que.

New tenders are invited for the construction of power house extensions to cost (approximateely) $20,000. R. W. Farley, city engineer.

Kingston, Ont.

Camden township is to have a telephone service, a company have been formed and the capital fixed at $10,000. Dr. M. I. Beeman, president, ad J. K. Fraser, secretary. Work will begin immediately.

Montreal, Que.

The Board of Control are negotiating with the Montreal Light, Heat & Power Company, who are endeavoring to secure a contract for the city street lighting.

The Bell Telephone Company will install conduit systems on several of the city streets during the coming year.

The Central Light, Heat & Power Company are applying to the Quebec Legislature for an extension of their charter privileges which will enable them to distribute power through the City of Montreal.

The Dominion Light, Heat & Power Company, Montreal, will apply to the Quebec Legislature for permission to increase their capital stock.

Nelson, B.C.

The Nelson Street Railway Company have ordered cars from the Ottawa Car Company, of Ottawa(while rails for extensions will be supplied by Evans, Coleman & Evans, of Vancouver, B.C. Contracts for building new lines will be let at an early date.

Niagara Falls, Ont.

An Act of incorporation of the Niagara Falls, Welland & Dunnville Electric Railway. The capital stock of the company is $200,000. Bonds may be issued for $30,000 a mile. The provisional directors are J. Carlton Gardner, civil engineer, Niagara Falls; George Arnold, F. E. Misener, G. H. Burgar and H. A. Rose. The head office will be located here. The company may build a single or double track. They can run in the following townships: Stamford, Thorold, Crowland, Town of Welland, [illegible] Sherbrooke. A branch line may be run [illegible]

[illegible]

[illegible] nipeg to make arrangements for the con [illegible]

[illegible]

Tenders and For Sale Department

CITY OF STRATFORD

[illegible] will be received until 5 p.m. [illegible] 1910, for approximately 57,000 [illegible] yards of [illegible]. Specifications and [illegible] may be had on application. Lowest or any tender not necessarily accepted.

M. FERGUSON,
City Engineer.

Plant for Sale

[illegible] The following Second Hand Plant, [illegible] Ont., or portion thereof. The whole lot at a reduced price,

25 No. 3 American, square pan, wooden hub, Wheel Scrapers.

28 No. 3 K. & J., round pan, iron hub, Wheel Scrapers.

6 No. 8 Western, square pan, with doors, Wheel Scrapers.

7 No. 2. K &J, round pan, iron hub improved, [illegible] Scrapers.

[illegible] Gates, for No. 3 Wheel Scrapers.

[illegible] Scrapers.

1 [illegible] Heavy Plows.

Located at Three Rivers, Que.

One Large Travelling Clam Shell Derrick.

One Steam Pile Hammer (Cram Patent), with [illegible].

One Thomas Automobile (Model 31), 60 h.p., thoroughly overhauled and painted; location, Toronto.

THE RANDOLPH MACDONALD CO., LIMITED,
14 Crown Life Building, Toronto, Ont.

Tenders for

High Level Intercepting Sewer, Toronto

Sealed tenders, addressed to the Chairman of the Board of Control, City Hall, Toronto Canada, endorsed "Tender for Section No, 1, High Level Interceptor" or "Tender for Don Syphon, High Level Interceptor," etc., as the case may be, for the construction of the several sections of High Level Interceptor mentioned below, will be received by registered post only, until noon of TUESDAY, APRIL 19TH, 1910.

The following are the sizes and approximate lengths of the various sections:

1. Section No. 8, flattened shape, 1216 linear feet, 7-foot 10-inch by 10-foot.
2. Section No. 7, circular, 3246 linear feet, 9-foot 6-inch diameter.
3. Section No. 1, circular, 2072 linear feet, 9-foot 3-inch diameter; and 1336 linear feet, 9-foot diameter.

(Total length Section No. 1, 3408 linear feet.)

4. Section No. 2, circular. 2993 linear feet, 8 foot 9-inch diameter.
5. Don Syphon (crossing under River Don).

Specifications may be obtained from, and original drawings will be on file and can be seen at the Main Drainage Department, City Engineer's Office.

For the convenienec of contractors, sets of blue prints have been prepared and will be issued to contractors upon the deposit of $10.00, which amount will be refunded upon return of blue prints in good condition within thirty days of receiving tenders.

The usual conditions relating to tenders as prescribed by City By-law must be strictly complied with or the tender will not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman, Board of Control.

City Hall, Toronto, March 10th, 1910. 12

To Heating Contractors

Sealed tenders addressed to the undersigned will be received until noon on FRIDAY, THE 8TH OF APRIL, 1910, for the installation of a Steam Heating System to heat the Court House and County Buildings in Peterborough.

Particulars for guidance of parties tendering can be had on application to the undersigned.

ED. M. ELLIOTT,
County Clerk.

Peterborough, March 5th, 1910. 12

Tenders For

Gas Franchise

Bids, sealed and endorsed "Gas Franchise," will be received by the City Clerk of the Corporation of the City of Fort William, up to APRIL 1ST, 1910, for the letting of a Gas Franchise, including construction of Plant, Mains, etc., and operation.

Conditions, specifications and form of tender, on which bids must be submitted, can be obtained from the undersigned.

Lowest or any tender not necessarily accepted.

JOHN WILSON,
Assistant City Engineer,
12 Fort Wililam, Ont.

Temiskaming and Northern Ontario Railway Commission

Sealed tenders addressed to the undersigned, will be received up to 12 o'clock noon, on WEDNESDAY, APRIL 6TH, for the following:—

(A) All the works required in connection with construction of abutments to bridge at M. P. 48.91. Tenders to be marked on the envelope, "Tender for Abutments."

(B) All the works required in connection with construction of substructure of steel trestle for Wabis River, M. P. 119.13. Tenders to be marked on envelope, "Tender for Substructure of Steel Trestle Spans."

Plans and specifications may be seen, and forms of tender procured, at the office of the Secretary-Treasurer, 25 Toronto Street, Toronto, and at the office of the Chief Engineer, North Bay.

Certified cheque on a chartered bank of Canada for the sum of $200.00, must accompany tenders A and B, and the successful tenderer must also enter into an agreement satisfactory to the Commission for the due execution of the said works, and to furnish additional security for the due performance of contract in the sum of $400.00 in each case.

The lowest or any tender not necessarily accepted.

A. J. McGEE, Secretary-Treasurer,
25 Toronto Street, Toronto.

Toronto, March 17th, 1910.

Papers inserting this adertisement without authority, will not be paid for same. 13

Tenders for Bridge

Sealed tenders will be reecived by the undersigned up to noon on SATURDAY, MARCH 26TH, 1910, for the construction of a Concrete Arch Bridge consisting of three spans of 33 feet each, over the River Speed about three miles north of this City.

Plans, specifications and form of tender may be obtained upon application to the undersigned.

Copies of the plans and specificaions may be seen at the offices of the Contract Record Confederation Life Building, Toronto.

The lowest or any tender not necessarily accepted.

JAMES HUTCHEON,
Engineer.

Guelph, March 14th, 1910. 12

TENDER

City of Moose Jaw, Sask.

Pavments and Sidewalks

Sealed tenders addressed to the undersigned and endorsed "Tender A,," "Tender B." and "Tender C.," will be received until 8.30 o'clock p.m. on MONDAY, APRIL 11TH, 1910.

Contract "A"—Furnishing material for and constructing 33,300 square yards of pavement.

Contract "B"—Furnishing material and constructing 13,500 lineal feet of combined curb and gutter.

Contract "C"—Furnishing material for and constructing 116,500 square feet of concrete sidewalk.

Plans and specifications and form of tender may be obtained at the office of Angus Smith, City Engineer, Moose Jaw, Sask.

The lowest or any tender not necessarily accepted.

(Sgd.) W. F. HEAL,
City Clerk.

Moose Jaw, Sask. March 8th, 1910. 12

City of Brantford

Sewer Construction

Sealed tenders addressed to Ald. Joseph Minshall, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock noon on THURSDAY, MARCH 31st, 1910, for the furnishing and laying of about 2,180 feet of 12-inch extra strength Sewer Pipe, and 705 feet of 12-inch Cast Iron Pipe, together with 12 manholes; greatest cut 31 feet; average cut, 16½ feet.

Plans and specifications may be seen and instructions to bidders, and forms of tender obtained at the City Engineer's Office.

Each tender must be accompanied by a marked cheque for 5 per cent. of the amount of the tender.

Copies of the plans and specifications may be seen at the office of the Contract Record, Confederation Life Building, Toronto, and at B34 Board of Trade Building, Montreal.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.

City Hall, Brantford, March 4th, 1910. 12

Notice To Contractors

Tenders for Excavation and Intake Works

Sealed tenders, addressed to the undersigned, will be received not later than th NINTH DAY of APRIL, 1910, for Rock and Earth Excavation in th Beauharnois Canal, between Valleyfield and St. Timothee, also or Intake Works at Valleyfield including Coffer Dam and Culverts in Canal.

Plans, specifications and full particulars may be obtained at the office of The Canadian Light and Power Company, Montreal.

E. A. ROBERT,
Managing Director.

12

City of Guelph

Pavement Construction

Sealed tenders will be received by the City Clerk, up till noon on SATURDAY, APRIL 2ND, 1910, for the construction of approximately 15,000 square yards of Street Pavement with concrete curb, concrete base, and tar macadam or sin ilar bituminous surface.

Plans and specifications may be seen and forms of tender obtained at the City Engineer's office on and after March 26th, or at the office of the Contract Record, 504 Confederation Life Building, Toronto.

The lowest or any tender cnt necessarily accepted.

JAMES HUTCHEON,
City Engineer

Guelph, March 19th, 1910. 12

Tenders for Pipe and Water Connections

Sealed tenders ill be received by the City Clerk, Brandon, Man., until 12 o'clock at noon on FRIDAY, THE FIRST DAY OF APRIL NEXT, for the supplying of

About from 100 to 200 tons of Cast Iron Pipe and Specials;

About 3,000 feet each of 10-inch and 12-inch Sewer Pipe;

Also brass goods for water connections etc.

All tenders to be f.o.b. Brandon, Man.

The lowest or any tender not necessarily accepted.

Further particulars and specifications can be obtained at the City Engineer's office.

R. E. SPEAKMAN,
City Engineer,
Brandon, Man.

1[illegible]

Supply of Steel Pipe

Tenders will be received by registered post only addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on APRIL 5TH, 1910, for the supply of one thousand feet of rivetted steel pipe, [illegible] diameter, and also twenty flexible joints.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications may be seen and forms of tender obtained at the office of the City Engineer, Toronto, and at the office of the Canadian Engineer, at B33, Board of Trade Building, Montreal.

The usual conditions relating to tendering as prescribed by City By-law, must be strictly complied with, or the tenders will not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman, Board of Control.

City Hall, Toronto, March 18th, 1910. 1[illegible]

TENDERS

Sealed tenders addressed to either of the undersigned and marked "Tender" will be received until noon on WEDNESDAY, APRIL 6TH, 1910, for the building of Concrete Abutments and Floor for a Steel Bridge to be erected over the Sydenham River between the Townships of Moore and Sombra.

Plans and specifications can be seen at the office of the undersigned, and also at the office of Bell & McCubbin, Civil Engineers, St. Thomas. A marked cheque for $200.00 must accompany each tender.

T. H. HOLMES,
Colinville, Ont.
NEIL McGUGAN,
Wilkesport Ont.

March 18th, 1910. 13

Town of North Battleford

Province of Saskatchewan

WATER WORKS AND SEWERAGE WORKS

Sealed tenders will be received by the Secretary-Treasurer of the Town of North Battleford until 8 p.m. on TUESDAY, APRIL 19TH, 1910, for the following works:—

Contract "A" Pipelaying, Waterworks, and Sewers.
Contract "D"—Cast Iron Water Pipes.
Contract "E"—Fire Hydrants, Vales, etc.
Contract "L"—Concrete Reservoir.
Contract "X"—Sewage Disposal Works.

Plans and specifications may be seen at the office of the Chief Engineer, Winnipeg and Toronto and at the Town Hall, North Battleford.

J. A. FOLEY, Esq.,
Mayor,
North Battleford, Sask.

S. COOKSON,
Secretary-Treasurer,
North Battleford, Sask.

WILLIS CHIPMAN, C.E.,
Chief Engineer,
Winnipeg and Toronto.

13

Town of Weyburn

Province of Saskatchewan

WATER WORKS AND SEWERAGE WORKS

Sealed tenders will be received by the Secretary-Treasurer of the Town of Weyburn, until 8 p.m. on WEDNESDAY, APRIL 27TH, 1910, for the following works:—

Contract "A"—Pipelaying on the Sewerage System.
Contract "B1"—Water Works Pump House.
Contract "B2"—Power House.
Contract "F"—Mechanical Water Filters.
Contract "G"--Water Works Pumping Machinery.
Contract "S"—Sewer Pipes.
Contract "W"—Furnishing Wooden Stave Pipes.
Contract "X"--Sewage Disposal Works.

Plans and specifications may be seen at the office of the Chief Engineer Toronto and Winnipeg, and at the Town Hall, Weyburn.

R. H. SMITH Esq., M.D.
Mayor,
Weyburn, Sask.

GEO. ROSS, Esq.,
Secretary Treasurer,
Weyburn, Sask.

WILLIS CHIPMAN C.E.,
Chief Engineer,
Winnipeg and Toronto.

1[illegible]

Positions Wanted

[illegible] handling men and getting results, and a hustler, is [illegible]

[illegible] struction, is open to engagement with architect [illegible]

Town of Weston

Province of Ontario

Water Works

Sealed tenders will be received by the Village Clerk until 8 p.m. on MONDAY, APRIL 18TH, 1910, for the following works:—

Contract "B"—Pump House.

Contract "F"—Mechanical Water Filters.

Contract "G"—Electrically Operated Pumping Machinery.

Plans and specifications may be seen at the office of the Chief Engineer, Mail Building, Toronto, or at the Town Hall, Weston.

R. J. BULL, Esq.,
Mayor
Weston, Ont.

J. H. TAYLOR, Esq.
Clerk,
Weston, Ont.

WILLIS CHIPMAN Chief Engineer,
204 Mail Building, Toronto, Ont.

13

Power Plants, Electricity and Telephones

(Continued from page 25.)

Stratford, Ont.

A by-law will be submitted to the ratepayers for the sum of $55,[illegible] to provide a plant for distribution of Niagara power from the Hydro-Electric Commission.

Vancouver, B.C.

City Electrician McCrossan, having reported adversely on the lighting system of Granville street bridge, was authorized to call for tenders for reconstructing the lighting system. Estimated cost, $1,500.

Victoria, B.C.

The acceptance of the tender of the Hinton Electrical Company for sixteen poles at a total cost of $1,840 has been recommended. Tenders for carbons for the street lighting service to be considered shortly.

The following prices for pillars for lighting system were quoted: Victoria Machinery Depot, $69 each; Marine Iron Works, $58.80; E. A. Earl & Company, London, $47.78; without globes or wiring, or $58.45 complete; Hutchinson Bros., $73.50; Findlay, Durham & Brodie, $72.50, wiring and globes not included, $93 complete; Hayward & Dodds, $78, with globes of larger sizes, $86 and $88. It was decided to call for tenders for 200 pillars and [illegible]

Welland, Ont.

C. J. Laughlin, of Hartford, Conn., is [illegible] twenty-year franchise for a street railway in Welland. Geo. R. Boyd, town clerk.

Wetaskiwin, Alta.

The by-law to raise $5,000 for extension of power plant has been carried.

Winnipeg, Man.

[illegible]

[illegible] tion of a five wire fence and gates along both sides of the city's transmission line [illegible]

[illegible] Whiting, per mile, [illegible]; W. J. Holmes, per mile, $170; P. H. [illegible] per mile, [illegible]. These [illegible] [illegible] [illegible] sion line which, it is estimated, will amount to about twenty-four miles. This, at the price of the lowest tender, would amount to some twenty-five thousand dollars, which is much is excess of the estimate.

Woodstock, Ont.

Tenders addressed to G. C. Eden, city treasurer, will be received until April 6th for $27,500 electric light and power debentures, [illegible] per cent. John Morrison, city clerk.

AWARDED.

London, Ont.

Contracts totalling [illegible] have been awarded by the Water Commission for [illegible] Commission as follows:—Canadian Westinghouse Company, Limited, transformers, switchboards and portable instruments; Canadian General Electric Company, [illegible] regulators, lamps and reflectors.

Midland, Ont.

In addition to the contract let to the Wm. Hamilton Company, noted in last issue, for 5 turbines, etc., contracts have also been awarded as follows:—Two 200 h.p. exciter turbines, William Hamilton Company, manufactured under the Leffel design; two feed pipes with the regulating stand pipes, Wm. Hamilton Company. All the electrical machinery, Canadian Westinghouse Company, covering up to five 900 k.v.a generators and two 100 kw. exciters with transformers, switching and lighting arrestor equipments for both the Big Chute and Midland stations. Line wire, Northern Aluminum Company; insulators, Pittsburg High Voltage Insulator Company. Pratt & McDougall, of Midland, have the general construction well under way. It is also announced on good authority that the Simcoe Railway & Power Company, for whom this construction is being done, will ultimately construct an electric railroad to serve this district. Mitchell & Mitchell, consulting engineers, Traders Bank Building, Toronto.

Miscellaneous

Calgary, Alta.

Works Board have recommended that they be authorized to call for tenders and let contracts for supply of copper wire up to 50,000 pounds in order to get enough wire on hand to maintain the supply for the department and on account of the rapidly rising market, the rate being now about 18 cents per pound here.

Tenders are being called until March 31st by the C. P. R. management for the following: Regina, brick freight shed; Moose Jaw, extension to present frame freight shed; Weyburne, frame freight shed; Medicine Hat, brick machine shop; Lethbridge, extension to brick station; Calgary, 18 stall brick engine house and attached machine shop; Calgary, addition to present brick machine shop; Calgary, addition to station and standard stores building; Red Deer, brick station; Banff, station building; Laggan, station building; Cranbrook, Y. M. C. A. and other buildings.

London, Ont.

Tenders for the following supplies will be received until March 24th: Cement sidewalks, cement curb and gutter, lumber, hardware, iron castings, gravel, broken stone, sewer pipe and cement, concrete pipe. Specifications, etc., at office of A. O. Graydon, city engineer. Ald. J. A. Tancock, chairman No. 2 committee.

Montreal, Que.

Recent building permits include: B. Damien, 898 Mount Royal avenue, one house containing two dwellings and one store, cost $5,000; M. E. Field, 176 Dorchester street west, one house containing three dwellings on St. Dominique street, cost $3,700; A. Trudeau, 302 Clark, one house containing three dwellings on Laurier avenue, cost $2,800; A. Arsenault, Du Convent, two houses containing six dwellings, cost $7,500; C. Racine, Ahunstic, Sault Recollect, two houses containing six dwellings, on Laurier avenue, cost $9,000; A. Russel, 427 Guy street, one house containing one dwelling, cost $6,500; A. Deschambault, 2245 Mance street, one house containing one dwelling on St. Catherine street west, cost $9,200; A. Kelly & Company, 43a Mentana street, one house containing three dwellings on St. Hubert street, cost $6,700; H. Moiseux, 987 Charlevoix street, one house containing three dwellings on Calumet street, cost $6,000; Les Clarcs street Viateur, 1259 St. Dominique street, one house containing two dwellings and one store, on St. Denis street, cost $7,500; Dobrofsky, & Rosenburg, 3 Ontario street west, four houses containing twelve dwellings, on Esplanade avenue and St. Uurbain street, cost $22,000; H. Longton, 229 Dufresne, one house containing two dwellings and one store, on Gilford and Boyer streets, cost $6,000; Rutherford & Son, Atwater avenue, one house, cost $8,500; R. Marks, 199 Craig street east, two houses containing four dwellings and two stores, cost $8,800; Matthewson & Son, 204 McGill street, alterations to building at 206 McGill street, cost $2,100; A. Delorme, 190 St. Hubert street, alterations to buildings at 187 Wolfe street, cost $2,500; J. & C. Morgan, Colonial House, alterations to building at 81 Union avenue, cost $2,000; Armand Bastien, 669 Cowan street, alterations to building, cost $1,500; Montreal Street Railway, Craig street west, alterations to building on Fleurimont street, cost $6,000.

Ottawa, Ont.

Tenders addressed to L. K. Jones, secretary, Department of Railways and Canals, this city, will be received until April 11 for improving upper entrance to lock No. 17. Plans, etc., at office of Chief Engineer of the Department of Railways and Canals and at the office of C. D. Sargent, resident engineer, Cornwall, Ont.

St. Anne, Man.

The ratepayers have passed a by-law to issue $20,000 5 per cent. 20-year debentures for roads, bridges, etc. J. A. Lacerte, clerk.

St. Thomas, Ont.

Until March 31st tenders will be received for the following debentures: $42,000, Hydro-Electric; $5,752.08; $11,652.81; local improvement. W. B. Doherty, clerk.

Vancouver, B.C.

A building permit for the new block to be erected for the Canada Life Assurance Company on the old Leland hotel property site has been issued. This building will be eight storeys in height and of steel frame construction. Another large permit was that given to Mr. A. Mitchell, stable, on Hornby street, between Nelson and Helmcken, $30,000; J. B. Arthur, 2375 Sixth avenue west, $2,800; W. H. McLeod & Company, 1260 Charles street, $2,000; J. Sibbold, 2715 Second avenue west, $2,500; A. H. Glover, 1016 Eleventh avenue west, $2,500; J. E. Christian, frame dwelling and stores, Columbia street, $3,000; S. D. Stewart, frame dwelling, Comox street, $5,000; H. Mutrie, frame dwelling, $2,812; Yukon street, $8,000; Mrs. H. J. Foote, frame dwelling, 254 Twelfth avenue, $4,500; H. H. Thompson, 827 Barnard street, $3,000; G. H. Cottrell, Power street, $9,000; Passage & Tomlin, 1829 Bismarck street, two houses, $4,000; T. B. Hydnman, 1220 Barclay street, $6,000; M. McLean, 356 Eleventh avenue west, $6,000; W. W. Stuart, 13 Fifth avenue east, two houses, $6,000; McLean & Matheson, 2717 Woodland drive, $2,600; W. W. Stuart Lumber Company, Front street, $5,000; William Simpson, Woodland drive, four houses, $6,000; M. Campbell, 1348 Sixth avenue west, $3,000.

Victoria, B.C.

Recent building permits include: John Kayton, seven-roomed house on Yates street, $3,000; L. Tobin, for additions to a tea room on Fort street, $2,300; W. Berridge, for a six-roomed house on Vancouver street to cost $2,800; D. O. Cameron, six-roomed house on Harbinger street, $2,500; A. E. Todd, for a ninety-room apartment house on the corner of Fort and Cook streets, to cost $40,000; Smith Brothers, for a $2,600 house on Belcher street and Oak Bay avenue; George Richardson, dwelling on Gore street to cost, $3,300; Miss A. Boorman, dwelling on Fisguard street, $2,100; T. Williams, alterations and a new front to store on Yates street, $3,000; R. Bray, brick stable, 34 Johnson street, to cost $3,200; Lemon Gonnason Mill Company, concrete kiln and drying room, $2,000.

Winnipeg, Man.

The permit for the new Bank of Montreal building has been issued, $950,000. Other permits: Residence on Alexander avenue between Blair and Vincent street, for A. E. Fuljames, valued at $2,500; dwelling on Redwood avenue between Brown and Sinclair streets for J. Vogel, valued at $2,000; two dwellings for Dunn & Wallace, one on Broadway, betwen Broadway Place and Shore street, and the other on Home street, between Buell and Bath, valued at $4,000 each.

AWARDED.

Aylmer, Ont.

Baily Brothers, of Aylmer, have obtained the contract from the Government for the building of two large barges to be used in connection with dredging operations on the Ottawa river.

Ottawa, Ont.

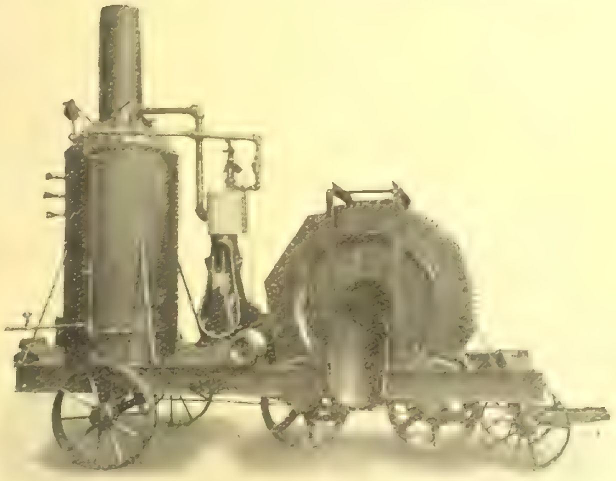
Barrett Brothers, this city, have been given the contract for dredging the Carp river.

The B. C. Gazette gives notice of the incorporation of the following companies:—Stewart-Portland Canal Power, Light & Water Company, Limited, capital $250,000; Vancouver Texada Lime Company, Limited, capital $50,000; Mather, Yuil & Company, Limited, acpital $50,000, incorporated to carry on the business of mechanical electrical engineering and construction business; John R. Bowes Timber Company, Limited, capital, $10,000; the Howe Sound Timber Company, Limited, capital $50,000.

The new steel castings foundry of the Canada Iron Corporation, Limited, Londonderry, N.S., has recently been completed, and has begun active operations; a large number of orders are on hand. It is an up-to-date plant in every detail, and equipped with the most modern appliances for making steel, annealing, polishing, etc. etc.

HADSEL

A mixer combining all the advantages of a continuous and is a batch mixer



The loading hopper on our one-half yard mixer has a capacity of one half-yard of **unmixed material.**

A strong feature. The gate between hopper and mixer is so arranged that while one batch is being mixed and discharged the laborers are busy filling the hopper.

When the mixing batch is discharged the engineer pulls gate allowing unmixed batch to run into mixer and then closes gate, immediately permitting reloading of hopper to proceed almost uninterruptedly.

ROGERS SUPPLY COMPANY

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Creosoted Wood Paving Blocks

cut from the log in our own mills out of live Douglas Fir and creosoted to specification as to Oil and Pressure. Capacity 1,000 yards per day.

Bridge, Structural and Mining Timbers

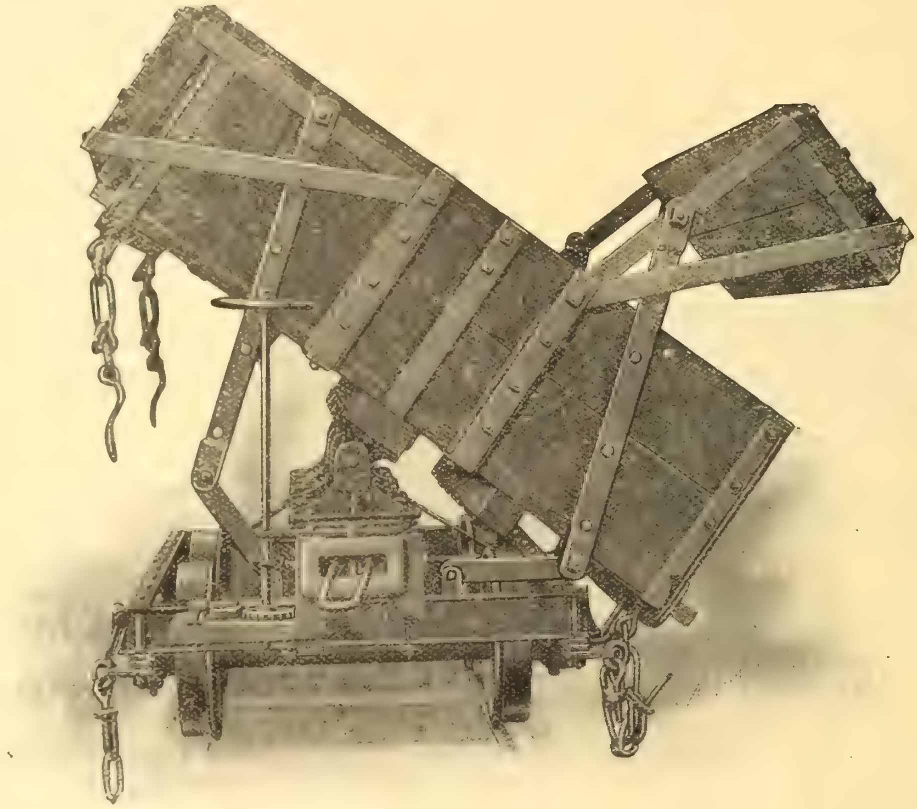
cut and sized to exact dimensions, and if so desired, framed in our yards before Creosoting.

Standard Creosoted Railroad Ties

Dominion Carbolineum Works Limited

Vancouver, B. C.

DUMP CARS



All
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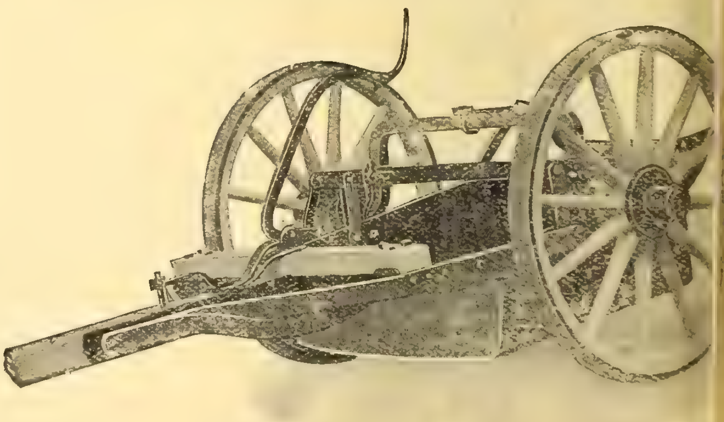
Scrapers
(Wheel and Drag)

Plows

Graders

Locomotives



Head Offices and Warehouses :
Montreal

MUSSEN

owing are offered for immediate sale at reduced prices. Quotations will be forwarded promptly on application :-

—45 ton Bucyrus Steam Shovel, 1½ yard dipper, in good condition; very low price.

—No 1 Smith Concrete Mixer, mounted on truck with gasoline engine, good condition.

—No. 1 Smith Concrete Mixer, mounted on skids with engine. Practically new machine. Has new drum and new gears. Engine thoroughly overhauled. New boiler and wheels could be attached, if desired, to suit buyer.

—35 ton Vulcan Steam Shovel (new) 1¼ yard dipper.

3—No. 4 Austin Jaw Crusher, mounted on heavy wheels for portable work. Practically a new machine.

—New Battery Wire Screen, 40 ft. x 17 in. No. 60 mesh.

—25 H. P. Vertical Boiler fair condition, low price.

—2 Selfrighting, Self Locking, Concrete Buckets, 1 yard capacity.

—Stiff Leg Derrick, 50 ft. boom with bull wheel and swinger, blocks and complete fittings.

3—Large Plate Shear, No. 31

4—Large Lever Punch, portable No. 4 with 16 bevel dies, 13 flat dies and 30 punches, punches 1 inch round hole in 1 inch plate, fine condition.

6 No. 3 "Canada" Wheel Scrapers in first-class condition.

1 Old Chain Block.

1 12 inch Single Wire Rope Block with Hook.

2 12 inch Single Wire Rope Block with Shackles.

1 10 inch Single Wire Rope Block with Hook.

25 B. & R. Car Movers, (new).

1 Pair Johnston wrecking frogs (new).

No. 729—Centrifugal Drier. —Centrifugal Drier, copper basket, phosphor bronze foot and bearings. Capacity about three tons per hour, 850 R. P. M. Countershaft brackets and pulleys included, all in perfect order. Brake only missing.

No. 840—Rubber Belting.—1 Roll 6-ply Rubber Belting, 14 in. wide x 71 feet long, branded "I. P. Harris Patent North British Rubber Co. Edinburgh."

No. 841—Battery Screens.—24 Slotted Screens 15 in. x 52 in. 60 mesh.

No. 842—Battery Screens—Diagonal Slotted Screens, size 14 in. x 51 in.

No. 843—Battery Wire Screen.—1 Roll 50 mesh Battery Wire Screening 18 in. wide x 10 feet long.

No. 844—Twist Drills.—Standard Tool Coy's straight shank twist drills, 9/16 in. to 1 1-4 in.

1	9/16 in.	.36c	each	net cash
2	5/8 in	.42c	"	"
1	3/4 in	.56c	"	"
1	13/16 in	.65c	"	"
1	7/8 in	.74c	"	"
1	1 in	.96c	"	"
1	1 1/8 in	$1.14	"	"
1	1 1/4 in	$1.35	"	"

Lot of samples conveying machinery and elevator buckets.

Lot of dump car irons.

20 Axles 21 in. long.

Lot of Emery wheels.

LIMITED

BRANCHES:

Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

All Floors in this Building are Reinforced Throughout with

Beath's Triangle Mesh

Some Users:

Winch Building,
Vancouver, B.C.

Victoria Sheds,
Victoria, B.C.

Petrolea Bridge Co.,
Petrolea, Ont.

Filtration Plant,
Toronto, Ont.

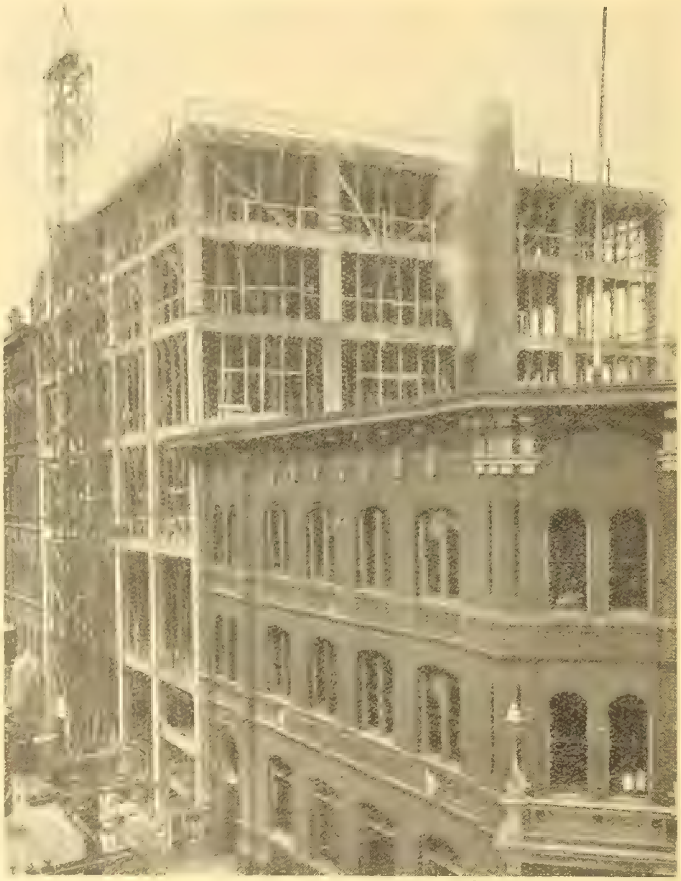
Thomas C. Watkins
Hamilton, Ont.

Halifax P.O.,
Halifax, N.S.

Dominion Exp. Co.,
Ottawa, Ont.

Erindale Power Co.,
West Toronto.

Dominion Concrete
Co., Kemptville, Ont.



Cut shows Reinforced Concrete Building under construction for the Thomas C. Watkins Departmental Store, Hamilton.

Some Users:

Joseph Vincent,
Union, Ont.

Robert Simpson Co.,
Ltd., Toronto.

Murray Shoe Co.,
London, Ont.

Septic Tanks,
St. Thomas, Ont.,

Septic Tanks,
Clinton, Ont.

Transformer Stations at Toronto, Dundas, Niagara Falls, St. Thomas, London, Woodstock, Paris, Preston, St. Marys, Stratford, Guelph and Berlin.

This System of Concrete Reinforcement is rapidly becoming known as "The Most Satisfactory and Economical System" on the market. One million square feet of Triangle Mesh sold in Canada during 1909, its first year, attest its popularity among discriminating Architects, Engineers and Contractors. If you are contemplating or have under construction a modern fireproof building it will pay you to investigate "The Beath System."

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W. D. Beath & Son, Limited

Toronto - Canada

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

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Vol. 24 Toronto March 23, 1910 No. 12

The Cement Convention at London, Ont.

The officers of the Canadian Cement and Concrete Association are deserving of great credit for the enterprising manner in which they have perfected all the details for their second annual convention, which is to be held at London, Ont., March 29-April 1.

There is every indication that there will be an excellent attendance at the Forest City. Despite the criticism that one hears occasionally concerning these conventions, the opinion is gaining ground that the progressive worker cannot afford to miss them. The man who goes to the convention as a visitor can scarcely help getting a certain amount of education, while he who attends as an exhibitor, given average ability, can hardly fail to make sales that will amply compensate him for his time and trouble.

The cement interests are doing their part well. They realize that concrete has to make its own way to a certain extent with the individual user of cement in the East, where there is less eagerness to experiment than in the West. No under-rated value should be placed upon the exhibition, for here one is enabled to see the most up-to-date concrete machinery and to have an ocular demonstration of the latest improvements therein. The Canadian Cement and Concrete Association is comprised of earnest practical workers, and this fact alone speaks success. It is only to be expected that the cement industry will experience rapid growth, and the well advised contractor will keep himself posted on the latest developments of the business so as to be able to meet the demands which must inevitably be made on him in the near future.

The Canadian Cement and Concrete Association is directing its efforts to having concrete construction carried out along more satisfactory lines and is gathering up more reliable information concerning the proper uses of cement. An important matter that will be taken up next week is the framing of standard specifications. The opportunity to take part in such work is not presented every day.

The cement machinery exhibits, which will form an important part of the Show, will provide an opportunity for contractors and others to study the various machinery in operation and to make a satisfactory selection for their needs. In this line we know of a number of interesting improvements that have been produced since the interval of last year's convention, and we feel confident that the exhibition will prove of much interest to all who wish to be in line with up-to-date methods.

The range of subjects covered by those who have prepared papers for the convention is a most extensive one, according to the particulars published in this number and preceding issues. Under the chairmanship of such an authority as Professor Gillespie, every encouragement will be given to interesting and practical discussions, and we look for elucidation upon many interesting points from this source.

Doubtless, at this convention there will be a good representation of those interested in municipal work, for every city, town and village in the country makes use of cement, and it must be in the interests of each one of these municipalities to learn something more concerning the correct and economic uses of a material which during recent years has effected something like a revolution in nearly every form of construction work.

It is not to be supposed that the use of cement has in any way settled down upon the basis of previous knowledge. Every year shows a change toward a wider and greater use of the article, and for many new and hitherto unsuspected uses, as well as a further development along former lines, of which it is an expensive proposition and a real loss to remain in ignorance. The increased knowledge of this year over last will be surprising to those who have not kept closely in touch with the situation.

Copies of the "Contract Record" (April 6th), containing a report of the meeting, will be sent to those who hand their cards to either the editorial or advertising representatives of this journal in attendance at the convention.

The Contract Record and the Reader

Consider the interests in which this journal is published. Are they identified with yours? If they are, read the "Contract Record" intelligently and critically, and let us have the benefit of your suggestions from time to time.

Broadly speaking, there are three kinds of readers of a trade journal: the appreciative reader, the indifferent reader and the growler. With the first and last of these it is easy to deal. The appreciative reader is already pleased, and at least there is some hope for the growler that is, if renewed endeavor and studied attention on the part of the editorial staff can effect it. But the indifferent reader is a hard case. The object of the "Contract Record" is to discourage indifferent reading; to publish a journal that is so closely bound up with the interests of its readers that they *cannot afford* to remain indifferent.

A prominent British Columbia architect writes: "I have been greatly interested in the 'Contract Record,' and find it full of information necessary for a practical architect."

A large contractor of Moose Jaw, Sask., writes: "I wish to express my appreciation of the splendid improvement effected in the 'Contract Record.'"

New System of Reinforced Concrete Work

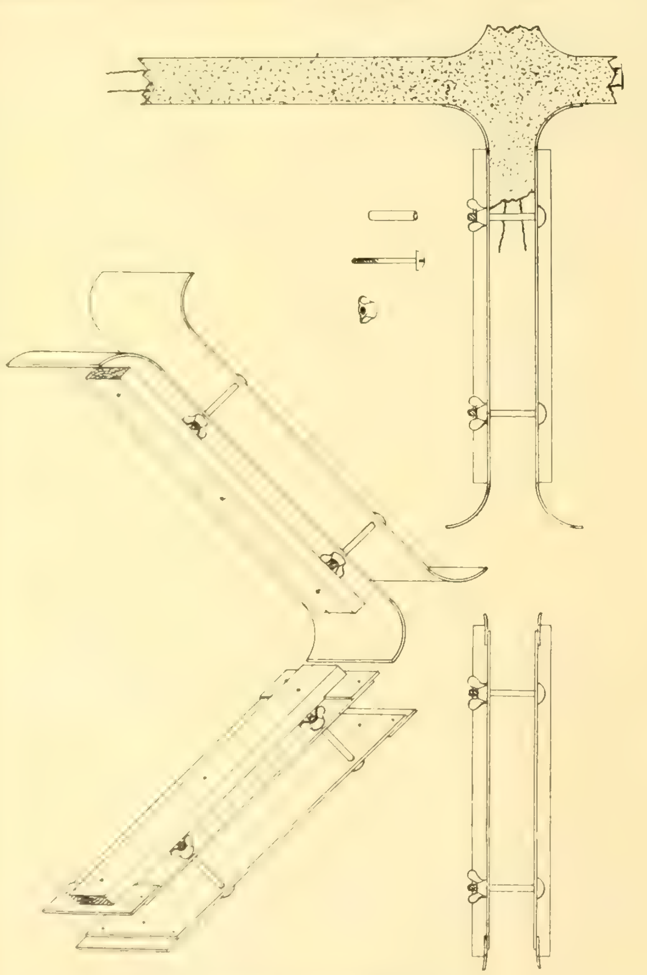
For Harbor Improvements, Piers, Bridges, and Similar Structures Complete Details of Interesting and Up-to-date Methods

Specially Contributed by Paul T. C. Dumais, Hull, Que.

In the season of 1898, after I had completed an important crib work which had been floated down and was anchored in position for sinking, a sudden hurricane arose and scattered nearly 50,000 cubic feet of solid cribbing. From that time on I have endeavored to improve crib work so as to eliminate such risks. As a result, I have evolved a system (and obtained patents in connection with same) by which a series of sub-structure cribs erected in a sheltered place can be floated safely to the site selected and sunk in position without ballast material, at a great saving of time over that involved by the ordinary method. My investigations revealed the fact that the purpose is fulfilled by means of a watertight crib combined with a watertight, concrete structure.

The system of construction outlined herein relates to a method and apparatus for sinking foundation cribs and consists in the details of construction and operation that will be described and illustrated.

It is well known that an ordinary timber crib (one without a watertight floor) can easily be floated with a portion or the whole of its timber superstructure and sunk in favorable weather, barring accident, just as well as can be done with watertight cribbing. But how could the floorless, water-soaked crib be navigated to its site? How could it float, if its superstructure consisted of reinforced concrete and weighed three times as much as one composed of timber?



Details of Moulds Patented by Mr. Dumais

Without the buoyancy imparted to the crib by its watertight platform, a concrete superstructure cannot be erected as desired, unless recourse be had to the compressed air caisson, to coffer damming or to the system of huge steel floats. These devices, however, are very expensive and at times dangerous, and further, they call for considerable engineering skill; besides, in many cases, they cost almost as much as the permanent structures in connection with which they are erected.

It may otherwise be proposed to build the substructures in situ as well as in sheltered spots; at a distance, upon cribs floating or held up by floats, to be withdrawn therefrom after the sinking has been performed. This latter method may be less expensive than the coffer-dam and pneumatic caisson methods, but if the desired result be attained through the mere arrangement of the constituent materials, independently of outside appliances, the work must be considered reduced in cost. The method embodied in my system, besides requiring much less skill in the engineering direction, favors the use of labor saving devices, as in surface work, is more rapid in execution, and never exposes the laborers to the risks attendant upon pneumatic caisson.

Water-Tight Platform

The main feature of this method consists in a watertight platform, crib or caisson, upon which a concrete structure may be erected in a sheltered spot at a distance from the place of sinking; this structure to be floated in place when partially or completely finished, and sunk in desirable weather.

The watertight platform upon which the reinforced walls will be permanently moulded, will consist of two or more tiers of enclosing members, interjoined at equal intervals by cross bracing members; the whole to be covered with a floor made of two layers of plant, 4-inch thick, laid in opposite or parallel directions as may be desired, well seeped with pitch and tar, and having a strong sheet or tarred or paroid roofing paper laid between the same. As apart from keeping the platform watertight, this floor will have to support the pier ballast, reinforcing timbers are provided, and to further strengthen and protect the floor a layer of squared timber is set under the same.

The tarred paper will have to project 2 or 3 feet outside the platform so that after the last plank will b nailed down, the tarred or paroid roofing paper may b folded back on the last planks all round the platform and be well soaked with pitch and tar, so as to make a close and watertight joint between the wooden foundation and the concrete wall.

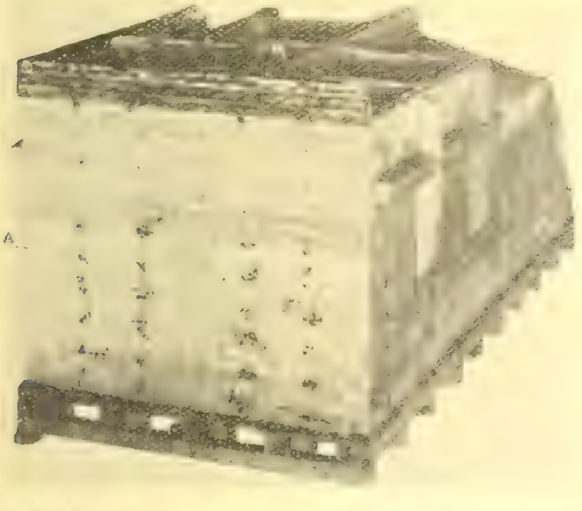
When the place of construction offers a good sheltere spot, a pier may be constructed of quite a large dimension, over 100 feet, and more.

In this case, the supporting platform does not requir to be very strong, except in regard to the squared timber ballast floor, which is to support the filling, for during the beginning of the construction, if the platform is not exposed to any accident occasioned by storm or high waves, a single frame may be sufficient to support the ballast floor, and when the reinforced concrete walls are moulded up to a height of 5 or 6 feet, they will offer enough rigidity to support the watertight floor and platform to which they are strongly anchored.

As soon as the concrete construction has attained a certain height, the increased weight of the walls will diminish the load carried by the watertight platform. Then the structure will easily carry the same with the assistance of the under-pressure of the buoyancy of the crib.

In starting the construction of the platform the building of this part of the structure may vary in some cases according to the bottom surface of the location where the intended crib, wharf, or breakwater is to permanently stand.

If the bottom be sloping or uneven it will have to be levelled in some way, either by dredging, or by filling in the lower portions and the soft part of the bottom surface with ballast stone to a perfect level. If the bottom of the location is of a slight or regular sloping and composed of hard clay or any other hard composition of soil, the platform may be built the same way as if the bottom ground were level.



Water line at A.

Reinforced Concrete Construction for Piers, Wharves, Breakwaters and Caissons.

In this case the end walls will have to be moulded with such an angle as to be vertical when the platform will rest on the sloping bottom surface.

As in certain cases of pier or other submarine work where the bottom soil has to be more or less penetrated, as also in earth foundations, the under surfaces of the crib-frame are given a wedge-like shape, the same being protected by a metallic shoe or rail firmly bolted thereon in the regular way. The material which I consider the most preferable, especially for the part that rests upon the floating crib or caisson, is reinforced concrete. It is well known that this material has heretofore been used all over the world either in the monolithic form, or with separate members to take the place of ordinary timber framing or masonry.

The floating platform or crib, already described, is the main apparatus of my method. The reinforced concrete walls, are started to form a monolithic superstructure on the top of the watertight floor. They are permanently moulded in place by means of suitable moulds. These moulds, or forms, as they may be called, are made of sheet steel plate, reinforced by a wooden or metal backing suitably rivetted at the outer face of the moulding plates. They are held in place by means of screw-bolts which pass through a sleeve, made of metal, or preferably with tarred paper, the length of which is made to correspond with the thickness of the walls. The moulds can be fixed to make the wall from 4 inches to 3 feet or more in thickness. The sleeve will serve to give a free passage for the bolt, and will remain in the wall, serving also to maintain the outside and inside plates of the mould solid in their right positions by means of the screw bolt, which holds the plate tight on to the sleeve. The mould plate used for the interior walls is given a quarter circle curve at the ends, projecting slightly on a straight line to fit squarely against the end of the other adjoining interior section of the mould plate, so as to give a strong reinforcement at the junction of the interior and exterior walls.

Before laying the first tiers of concrete on the watertight platform, it will be necessary to nail on the top of the tarred paper an angle-shaped wooden rod, at a distance from the edge of the outside of the platform, and under the centre of the wall. This will serve as a recess and close joint between the watertight floor and the concrete wall.

The first bars of reinforced iron will also have to be well anchored in the timber of the platform and stand vertically until the first layer of concrete is in place. Then the iron rods are to be bent so as to lay close onto the concrete in a horizontal position.

Standard Moulds Desirable

It is important that the moulds be made to a certain standard, so that the same moulds can be used for future construction. Each section of mould should be of regular size so as to form a square compartment in the interior of the construction, of between 8 or 9 feet square, and may be 2 feet high—the outside plate to be the same height and of sufficient length to correspond to two or three sections of the interior plates.

Valves of sufficient dimension have to be provided for use in sinking the crib or caisson, such to be placed vertically in the floor or horizontally in the first or second layer of concrete wall. An angle rail or tube may be fixed outside of the wall for the purpose of guiding the device used to open or close the valves.

A layer of 6 inches of concrete only, will be deposited in the mould at a time and then be well rammed in place, after which the reinforced iron will be placed in position. The other 6-inch layers of concrete may be deposited successively until the mould is filled up. Before the last layer of concrete has commenced to settle a V-joint, 3 inches by 3 inches, will be forced on the top and at the centre of the concrete wall, with a proper mould for that purpose, so as to make a good recess for the next layer.

As the wall may have to be reinforced vertically, drift bolts of sufficient diameter and length may be driven in the layer before the setting of the concrete.

All the inner reinforced iron rods of the longitudinal inside and outside walls shall be placed at about two inches from the interior side of the same, and will be bent so as to follow the curve of the plate mould, and be made to continue and connect at the junction of the interior cross and longitudinal wall, so that all the walls may be well connected and reinforced together with [illegible] connective reinforcement.

A sufficient quantity of moulds enough to proceed with the erection of the concrete wall for a day or two, will be necessary so as to leave the concrete hard enough before taking off the first filled up moulds and replacing them on the top of the part of the wall already constructed. The mould to be adapted to the concrete wall by introducing the lower bolt of the plate into the sleeve that remains in the upper surface of the hardened wall.

As the walls are raised, the floating crib gradually sinks. To preserve its buoyancy the openings formed by the sleeves, to support the bolts of the mould plates, are kept tightly plugged before the parts of the walls where they are located become immersed. These openings, before being plugged, may be used for the support of scaffolding brackets on either face of the walls, also to fasten vertical or horizontal fenders, in pier work.

When a section of a crib is completed, or is high enough to be sunk on its permanent location without being covered with water, and where it can be easily finished, it is then moved into place either by being towed by boat or cable, and is well anchored in its right position. It will then take but a few minutes, after the valves have been opened simultaneously, until it will rest on the bottom in security—the weight of the crib filled with water being more than sufficient to keep it down in place to await the time of filling. When all the walls of a crib are elevated to the height required by this method of construction, the interior will represent a structure of numerous watertight compartments which may be filled with sand, gravel and earth, instead of ballast stone, which sometimes has to be taken from a long distance to the place of sinking, and thus becomes an important item in the cost of such construction. If a contractor has to pay over one dollar per cubic yard for stone ballast for filling his wooden crib, he will appreciate a method of operation by which he can fill it with sand and gravel which can sometimes be dredged out at 50 feet from his crib and be easily dumped into it with the arm-pole of the dredge. In this case he will certainly save 75 per cent. on the amount of his bill for ballast.

Section of Completed Crib.

The dredging of 50 feet around a wharf cannot affect its security. In many cases such dredging will prove to be very convenient for navigation, and it may be that the law will require it to be done even at a less distance. Incidentally, there is often in the locality of such construction or in its vicinity any amount of sand, gravel and stone for the aggregate for the concrete as well as for the filling, and this will reduce the cost of the work to a considerable extent.

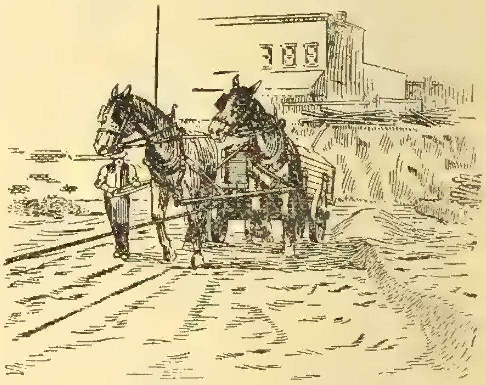
After the concrete walls have been finished and the filling completed, and if the crib or wharf is not exposed to the high sea waves, the pavement could be made by covering its surface (after it has perfectly settled down) with a layer of two feet of stone to form the foundation of good macadam. If the wharf is too much exposed to the high sea waves, then the pavement should be made of mass reinforced concrete having the top of the concrete walls for its foundation and support. All the necessary mooring posts (nigger heads), as well as ladders, rings and hardwood fenders, may be placed wherever required, with proper reinforcements, in the concrete wall during the construction.

In the erection of large wharves of more than 30 feet width, the application of this method of construction will offer an imortant economical advantage by building the watertight platform in a frame-like shape, having the side of a width of 10 or 12 feet, with reinforced concrete beams or iron rods crossing from one side of the frame to the other so as to brace them together, leaving only the empty space in the centre to be filled up with the material ballast.

When a wharf has to be built in a harbor or other sheltered place where strong current and heavy waves cannot have any effect on the construction, it will not be necessary for all the watertight compartments to be filled up to increase the weight of the structure. Many of them may be left empty and will be very convenient for the storage of freight, especially coal.

Cost of Cellar Excavation

The accompanying illustration shows work in progress of excavating for a foundation at Cleveland. The contractors agreed to remove 20,000 yards in 40 working days, or an average of 500 yards per day. The task was successfully accomplished with a small steam shovel—an automatic—35 teams, and a hoisting engine, the latter being used to aid the horses up the slope. A small wire cable, as shown in the cut, was hooked to the shaft of the wagon, power slowly applied, and the heavily laden wagon steadily drawn to the street above. Small shovels are peculiarly suited to this kind of work. The one used in this case is mounted on a light carriage with contractors' wheels, which, being moved by the shovel's power, do away with the trouble of rails and tracklaying. The shovel revolves a complete circle, and was timed to load 3 yards with its $\frac{5}{8}$-yard bucket in 45 seconds. The cost of excavating the 20,000 yards was estimated as follows:



Helping the Team up the Incline.

Care, feed, lodging 35 teams, $1\frac{1}{2}$ months	$2,000.00
Pay for 35 teamsters, 40 working days	2,000.00
Pay for 12 laborers, 40 working days	800.00
Steam shovel engineer, 40 working days	150.00
Hoisting engine engineer, 40 working days....	125.00
Coal (3 tons a day), 40 working days	300.00
Bosses ($10 a day), 40 working days	400.00
Total	$5,775.00
Add 10 to 12 per cent for accidents, repairs, depreciation, etc.	625.00
Total estimated cost	$6,400.00

Methods of Repairing a Concrete Chimney

Moulding a Jacket of Reinforced Concrete, 5 1-2 Inches Thick, around the Structure — Contractors' Ingenious Construction and Operation of Form

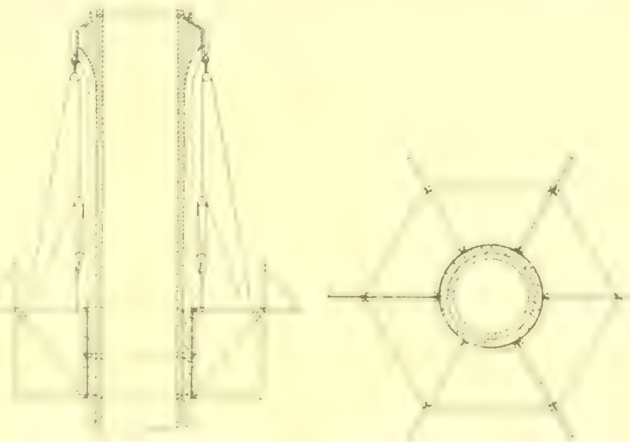
The work described consisted in moulding a jacket [illegible] inches thick of reinforced concrete around a cracked and leaky chimney at New Haven, Conn.

The original chimney was of reinforced concrete, but it had developed large vertical cracks which allowed the escape of smoke and at times the inflow of air—both of these actions being harmful to the efficiency of the draft. This chimney rested on a brick foundation which was part of the power house building. Above this foundation it was about 80 feet high, with outside diameters of 8 feet at the bottom and 6 feet at the top; it was 4 feet in diameter, inside, and was unlined. The old concrete, forming a wall about 4 inches thick in the cylindrical part of the chimney, had proved seriously defective, aside from developing cracks. It had been laid as a stiff, dry mortar, without stone, and by the time the contractors took hold of the job, the mortar had become so soft and "punky" that it crumbled easily under a blow, and came away from the reinforcing metal with dangerous readiness.

The new concrete jacket put about the old chimney was five inches thick over the whole surface of the old structure. The vertical reinforcement consisted of four sets of square twisted steel bars with 32 in each set, equally spaced, and with the ends of the successive sets lapped. The lowest set of bars ⅝-inch thick and 20 feet long, were upset at their lower ends to ¾-inch diameter, and were screwed into an anchor ring four inches wide by ½-inch thick sunk in the brickwork at the base of the chimney. The other three sets of vertical bars were ½-inch square and 24 feet, 22 feet and 20 feet long, respectively. Outside this system of lapped vertical bars were placed horizontal hoops of 3.8-inch square twisted steel, spaced six inches apart. The concrete of the shell was mixed 1 : 2 : 4, with the stone small.

Before the first section of the concrete jacket was applied the old chimney was carefully wrapped with asbestos felt. This served a double purpose, acting first as an expansion joint between the old and new structures, and serving also to protect the green jacket against too rapid drying by the heat of the inner shell, and against the drawing of moisture from the green concrete into the old chimney.

The aspect of the work which is of especial practical value, was the ingenious construction and operation of the form used by the contractors on the cylindrical portion of the chimney. The form proper consisted of a cylinder of 16 gauge iron, 5 feet high, with an inside diameter of 5 feet 8 inches. This was made in three equal sections divided vertically. The horizontal framing consisted of three 2x2x¼-inch angles rolled to a true circular arc. Each section of the form [illegible] therefore constituted a cylindrical surface of 120 degrees braced horizontally by the curved [illegible] one at the bottom and one midway between. [illegible] zontally from the top of each of these sections was built a platform braced diagonally to the bottom [illegible] with 2x2x¼-inch angles and [illegible] running to the upper corners of each [illegible] These three sections of form and staging combined were fastened together by bolts running through angle bars on the vertical edges of each section of the form and through the pairs of adjacent angle iron supports under the platform. The form and the working platform [illegible] ropes from three 12-inch single blocks, which were themselves hung from a [illegible] the chimney. The cylindrical portion [illegible] the form was involved, was made in the following manner: The asbestos having been applied over a height of about 5 feet from the top of the cylindrical form, the form was then raised, and concrete was filled into the space between the form and the chimney, and closely tamped about the reinforcing steel. The next forenoon the asbestos and steel were extended farther up the chimney, and the form was hoisted a distance of 4 feet 10 inches, leaving a lap of 2 inches on the concrete placed the day before. The concrete of the second day's work was placed in the afternoon, and was allowed to set until the next morning, when the form was again raised 4 feet 10 inches, and a new ring of concrete was placed that afternoon. The form and platform were prepared for hoisting by loosening the bolts in the facing angle bars which formed the three joints. This allowed the form to swing a little free of the new concrete and permitting of easy movement.


Sketch Showing Method of Slinging Forms for Jacketing a Chimney with Concrete.

An interesting feature of the preparatory work was the method by which the steeplejack reached the top of the chimney. One of the largest cracks in the old structure ran from the top to bottom, and this furnished a good place for driving in stout hooks. At the start, the steeplejack climbed up a ladder resting on the roof of the power house, and reaching up on the chimney drove a stout hook into the big crack. From this hook he then hung a small block carrying a rope. This combination made it possible to hoist a second ladder, which was allowed to lap on the first ladder, to which it was lashed. Climbing to the top of the second ladder, the steeplejack drove a second hook into the crack in the chimney, reaching up as far as possible. Putting a block and line on this second hook, he was able, after getting down to the power house roof, to raise another ladder, which was lashed to the second ladder. From the top of this third ladder he drove a third hook into the crack, and so extended his track another space upward, and so on. The ladders had hooks at the ends, which held them away from the chimney. They were held [illegible] — Engineering-Contracting.

[illegible]

Interesting Reinforced Concrete Construction

The accompanying photographs represent the stop butt and shelter at the rifle range, Brandon, Man., constructed by Mr. Paul T. C. Dumais, public works contractor, Hull, Que., the result of whose investigations in reinforced concrete structural work are discussed elsewhere in this issue. The contract for the work at Brandon, Man., was awarded for a timber crib construction. The Department of Militia, however, accepted the offer of Mr. Dumais to carry out the work in reinforced concrete. This resulted in the contractor realizing a profit of more than 8 per cent. over that calculated on the timber crib construction. The dimensions of the butt are as follows: Length, 130 feet; height over grade, 30 feet; width at base, 11 feet; width at top, 4 feet 9 inches; thickness of back and side walls, 8 inches; front wall, timber 8 inches by 8 inches, square cedar. Part of the interior walls are 6 inches thick reinforced horizontally with ½-inch iron bolted to timber of the front wall. The exterior walls are reinforced, vertically, with 2-inch old water pipe. The butt is filled up with earth and has a reinforced concrete roof, 4 inches thick. The structure has a neat and permanent-like appearance. The targets and shelter are situated 100 feet from the butt.

Stop-Butt, Brandon Rifle Range.

Shelter, Brandon Rifle Range.

The annual banquet of the Ottawa Builders' Exchange was held on March 16th at the Grand Union Hotel, Ottawa. Many of Ottawa's most prominent citizens attended the function. Mr. Geo. W. Crain, president of the Exchange, presided. Those present included Mayor Hopewell, Messrs. T. A. Shore, C. P. Meredith, J. A. Findley, T. D. McFarlane, Cecil Bethune, D. J. Driscoll and Wm. Rankin.

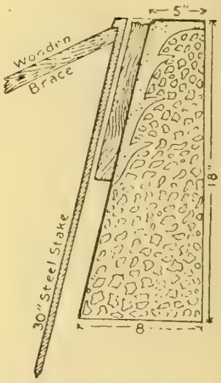
Something New in Concrete Piles

Concrete piles, now being used in the reconstruction of Senator Macdonald's wharf at Victoria, B.C., are being made by Thomas Stedham, inventor of a new process by which a framework of iron bars of steel from an inch and a half to two inches in diameter with a harpoon-like end and wire meshed from the four linear rods of iron, is built over with concrete. Mr. Stedham says the concrete piles manufactured by him for this wharf are being used for the first time on this continent. Twenty of them, weighing from three to seven tons each, are being used. They will be sunk, and driven into position with a pile driver similar to the driving of ordinary piles, and when in position will give the wharf greater strength than any local wharf. The concrete piers also have the advantage of being more lasting, offering scant scope to the busy teredo which thrives on the ordinary pile.

Concrete Curbing

A writer in "Municipal Engineering" describes a method of laying a concrete curb which has been found very satisfactory. He says: "We first made curbing with vertical walls on both sides, but soon found out that a much better curb could be made with less cement by making the side next to the gutter battering, and proceeded to do the work in the following manner:

"First excavate to the required depth of curb, say 18 to 20 inches, using the earth on one side as a mould, where conditions will admit of it. If the soil is sandy no provision need be made for drainage. Next we set up a mould 2 inches thick, 12 inches wide, and 16 feet long, held in place with ⅞-inch steel stakes, set so as to make a curb 8 inches thick at bottom and 5 inches at the top. Then proceed to fill space with concrete, sliding the mould up as required, until the finish line is reached; float and trowel on the top and 12 inches down on the face. Cut deep into sections with pointing trowel, say 3 in 16 feet. Finish front edge to straight edge with quarter-round. Trim edge next to lawn to straight edge, leaving that edge sharp. This makes an ideal curb, looks well, stands well. Note the manner in which the facing is anchored to the backing, as shown in the sketch. After trowelling, brush the work to give it the appearance of sawed stone. We do not consider it necessary to use any metal in constructing curb."



Satisfactory Concrete Curb.

Mr. W. M. Dodd, architect, Calgary, Alta., will remove to Vancouver, B.C.

To bring about the building of better structures and reduce the cost of fire insurance, it is proposed in London, Ont., to label every building in the city, of public or semi-public occupancy, as to its class of construction, whether "fireproof," "ordinary" or "dangerous."

According to a recent dispatch from Victoria, B.C., there has been such a muddle in the administration of civic affairs in that city that an agitation is afoot for the appointment of a Royal Commission to investigate the matter. An official report claims to show that the big reservoir completed last year at a cost of $100,000 is useless and will have to be rebuilt.

Notes on Modern Fireproof Construction

Reinforced Concrete Design Relative advantage of medium and high carbon steel for reinforcing—Interesting points of discussion

By Clarence W. Noble

In an informal talk on "Fireproof Construction," before the Engineers' Club of Toronto, Mr. Clarence W. Noble, contracting structural engineer, Toronto, brought out several points of interest. He suggested that fireproof construction can properly be divided into three portions. The first will be that dealing with marble, terra cotta and other materials which are handled primarily by the architect, and which only concern the structural engineer indirectly as they add to the loads with which he has to deal. The second will consist of such matters as are finally decided by the insurance companies or by the building code without the allowance of discretion on the part of the structural engineer. Such, for example, would be the arrangement of fire doors, construction of partitions around elevators, and the use of metal frame and wire glass windows. The third general head in which fireproof construction might be divided will be that which concerns fireproofing engineers in ordinary practice. This consists of the construction of the framework of the building, and the construction of partitions.

Mr. Noble gave a short history of modern fireproof construction, starting with office buildings of the present type as first constructed in Chicago. He explained that south of Chicago there is an endless deposit of most excellent fire clay to which engineers and architects naturally turn for the solution of their fireproofing problems. Tile made from this clay was therefore used for floor construction, for the fireproofing of beams and columns and for partitions.

Tests of Various Types of Construction

The speaker then reviewed briefly the excellent tests made by the New York building commissioners on various types of modern fireproof construction. He pointed out that these tests, which consisted of applications of intense fire to small isolated structures about nine feet on the side, was a first-rate test of the fireproof qualities of the materials thus used, but an inadequate test of the type of construction. The failure of fireproof construction when used in actual buildings is not due so much to the heat as to the expansion stresses generated by the heat. In a small isolated structure these expansion stresses are necessarily slight or absent, as the structure has ample room to expand in every direction. When, however, the fireproofing material surrounds a steel frame and thus protects the frame from expansion, the conditions are markedly different from those under which the tests were made. The speaker reviewed several of the great fires which have occurred testing modern fireproof construction, and pointed out that in every instance the failure of the type of construction used showed characteristic features which indicate failure by reason of expansion stresses. The [illegible] of partitions in tile or plaster block is the result of their crushing against the ceiling. The failure of terra cotta floors is due to the spawling off of the bottom webs in the blocks.

The use of metal lath and metal stud fireproof partitions was then discussed by Mr. Noble, who explained that these partitions are not subject to the usual difficulty, as they buckle when they expand, instead of crushing. Their failure is due to the failure of the plaster, which disintegrates in the heat, and is apt to be washed out by a stream of water thrown on it. Mr. Noble suggested that something better than any of the present types of fireproof partitions would result if metal lath and metal stud frames were to be plastered with Portland cement plaster. Partitions thus constructed would not crush and the plaster used would not be washed out by a hose stream.

Reinforced Concrete Design

The speaker then took up several much discussed points connected with reinforced concrete designs. Relative to the often-used specification regarding the straight line formula for obtaining the moment of resistance of a concrete beam, he explained that both the straight line and parbolic formulae have much to be said in their favor. Under actual working stresses the straight line formula used, very closely approximates the facts, while at the point of failure of the beam the parbolic formula very closely represents the facts. If the factor of safety is considered as representing a relationship to the actual stresses in the beam under working conditions, the straight formula should be used, while if it is regarded as a relationship between the point of failure of the beam and its working load, the parbolic formula should be used. Mr. Noble expressed a personal preference for the parbolic formula, but stated that it made very little difference which was used. He explained, somewhat humorously, the specification in favor of the straight line formula by stating that there is a general tendency on the part of people who have to decide these matters, to avoid a careful technical investigation of such points by accepting the most expensive alternative, on the assumption that it is the best.

Two other open questions in reinforced concrete illustrate this tendency. One was the denominator to be used in the bending moment formula. Mr. Noble explained that while $\frac{wl^2}{10}$ was the formula first advanced, it is not by any means the only one which can be used. The denominator in the formula for a moment at the centre of the span depends entirely on what denominator is used for the moment over the point of support. The sum of these two must always equal $\frac{wl^2}{8}$. $\frac{wl^2}{10}$ implies a bending moment so small for the points of support that the material necessary to resist it will, on account of the sharp curvature at this point, be stretched beyond its elastic limit. When this occurs the bending moment on the centre of the span will necessarily reduct to $\frac{wl^2}{8}$. Mr. Noble therefore strongly urged the use of a greater amount of material over the points of support, and explained that when such material is used the use of $\frac{wl^2}{10}$ at the centre of the span is excessive.

The continuance of the use of $\frac{wl^2}{10}$ in the face of the fact that better practice would indicate a different arrangement, Mr. Noble attributes to the general tendency to take the more expensive alternative rather than to make a careful technical investigation.

Medium and High Carbon Steel for Reinforcement

Mr. Noble also discussed the relative advantages of the use of medium and high carbon steel for concrete reinforcement. He pointed out that medium steel is generally used in the construction of the steel framework of buildings owing to the fact that material so used has to be punched, sheared and riveted during the process of fabrication.

High carbon steel, if used for such purposes, would have [illegible] than medium steel. Bars used for concrete reinforcement are not subject to this limitation. Yet as the majority of engineers now engaged in reinforced concrete designs gained their experience in structural steel, they continue the habits which they acquired while designing steel structures, and still use medium steel as the standard concrete reinforcement. The speaker pointed out that the elastic limit is now universally regarded as the criterion for the factor of safety of a reinforced concrete beam, and therefore the question to be decided as between medium or high carbon steel is merely one of the cost of a given amount of elastic limit in the two kinds of material.

The usual working stresses used with medium steel give a factor of safety in a reinforced concrete beam not greatly in excess of two for live and dead load. A factor of safety of three, if high carbon steel is used, can be obtained at a less cost than a factor of safety of two, with medium steel. While it is true that the variation in the elastic limit is high, carbon steel covers a wider range than with medium steel, the statement made implies discount of this variation, as it is true even if the assumed elastic limit of high carbon steel is placed at the minimum value, while the assumed elastic limit of medium steel is placed on the average value.

The tendency to use medium steel in the face of the superior cheapness of high carbon steel, Mr. Noble attributed to the general tendency to take the most expensive type on the assumption that it is the best. With this tendency Mr. Noble emphatically disagrees, claiming that for a given amount of money he can give nearly twice the amount of strength, together with mechanical bond, by using a grade of steel having an elastic limit of 55,000 pounds per square inch, instead of a grade of steel having an elastic limit of 35,000 pounds per square inch.

DISCUSSION

After the speaker had concluded his talk, there was an informal discussion on the part of the members. Mr. Young inquired if the speaker regarded the formation of hair cracks due to the higher working stresses he proposed for his high carbon steel, as affecting the reliability of the structure, owing to the possibility of the steel rusting out.

Mr. Noble answered by explaining that these hair cracks are so minute that they had never yet been seen, even by the use of a magnifying glass. The tests which discovered them also showed that they are extremely irregular in their shape. The elements causing rust are air, moisture and carbon dioxide gas, all of which must be present at the same time. The carbon dioxide together with the water forms a very weak acid, which attacks the steel. In beams, the steel is at least two inches away from the surface of the concrete. The concrete is always impregnated with an excess of free lime, which is liberated during the setting up of the cement. This lime is frequently visible on the surface of concrete construction and continues to Effloresce for an indefinite period after the concrete is set up. It is reasonable to suppose that this tendency of the free lime to work to the surface extends along the interior surface of the minute hair cracks as well as along the external surface of the construction. The speaker claimed that it is practically impossible for the weak carbonic acid to work into the hair cracks in such quantities as to neutralize the ever-renewing supply of free lime and reach the steel. He pointed out that even should this be the case, the steel will be found to be coated with a protective covering resulting from the chemical action of the cement on the steel surface.

The Smart-Turner Machine Company, Limited, Hamilton, Ont., have sent us a copy of their power pump catalogue, No. 7, an informative, well illustrated booklet containing 64 pages and 135 cuts, devoted to the explanation of the special features of the centrifugal pumps, gas and gasoline engines, and other up-to-date products of this concern.

Gravel Versus Limestone

A Comparison of the Relative Merits of These Materials as a Factor in Concrete Aggregate

Comparing the relative value of washed gravel and crushed limestone as a factor in concrete aggregate, Arthur B. Hewson presented some interesting figures and facts before a recent meeting of the Architects' Business Association of Chicago. He contended that any given quantities of cement, sand and gravel mixed in the usual proportions, such as 1:2:4 or 1:3:6, will make at least 7½ per cent. more concrete than equal quantities of cement, sand and limestone; also that, at prevailing prices for gravel and stone, the former is decidedly the more economical, at the same time showing greater strength efficiency and fire-resistance.

The explanation of the greater bulk of gravel concrete, said Mr. Hewson, is that gravel, on account of the rounded shape of its particles, averages 7½ per cent. less in voids than crushed stone. When you mix concrete 1:2:4 or 1:3:6 you have 50 per cent. of sand to fill the voids in the coarse aggregate. If the voids in crushed stone absorb 95 per cent. of the sand and the voids in the gravel only 80 per cent., it naturally follows that 15 per cent. more of the sand appears in the gravel concrete, thereby increasing its bulk 7½ per cent. Practically all authorities agree that the voids in the averaged washed gravel are 40 per cent and in the average crushed stone 47.4 per cent.

Continuing, Mr. Hewson said: "It is agreed that the strongest concrete is that in which there is just sufficient sand to fill the voids in the coarse aggregate plus a small percentage to cover inequality in mixing, with the same conditions obtaining between the sand and cement. When you add more sand than this, you weaken your concrete. Does it not follow that, if gravel concrete excels limestone when compared in identical proportions, it would still further excel in comparisons where the sand is in the same proportion to the voids in both materials? For Illustration, would not a 1½:3:7 gravel concrete excel a 1:2:4 limestone concrete? Would it not be proportionately rich in cement? Would it not give an equal bulk of concrete and a greater strength efficiency with less sand and less cement? Furthermore, if a 1:2:4 limestone mixture produces a smooth finish, will not a 1½:3:7 gravel concrete do the same, since the proportion of mortar to the voids is identical in both cases?

"In confined spaces where the intervals between the reinforcing bars are small or the concrete must be forced through wire mesh, a denser and therefore stronger concrete can be obtained with gravel. The rounded particles work into place more readily and lie snug to the steel. There are few jagged edges to catch on the steel or on companion particles, forming pockets which reduce the strength and damage the appearance of the surfaces.

"Gravel concrete, properly proportioned, will produce water-tight walls, where limestone will fail under the same conditions. This is also due to the lesser proportion of voids and the closer association of the particles.

"With regard to the fire resistance of gravel concrete, Bulletin No. 370 of the U. S. Geological Survey shows its superiority over limestone. The limestone is badly damaged by calcination. This bulletin also shows that fireproofing tile, sand-lime brick and practically every other material except solid concrete are useless for fireproofing."

Standard Regulations for Concrete Users

Practical Code Relating to the Best Methods of Selecting, Mixing and Using Materials—Of Special Interest to Convention Delegates

A committee representing a number of national associations, ncluding the American Society of Civil Engineers and the merican Society for Testing Materials, has recently issued an laborate report on the best methods of selecting, mixing and sing various forms of concrete. This report may well be conidered as a standard code of regulations, and the following exracts, relating to practical features of the work, are here given s a handy reference summary:

The materials to be used in concrete should be carefully select-d of uniform quality and proportioned with a view to securing s nearly as possible a maximum density.

Proportions.

Unit of Measure.—The unit of measure should be the barrel, which should be taken as containing 3.8 cubic feet. Four bags, ontaining ninety-four pounds each on an average, should be onsidered the equivalent of one barrel. Fine and coarse aggregate should be measured separately as loosely thrown into the neasuring receptacle.

Relation of Fine and Coarse Aggregate.—The fine and coarse ggregate should be used in such relative proportions as will nsure the maximum density. In unimportant work it is sufficient to do this by individual judgment, using correspondingly higher proportions of cement; for important work these proportions should be carefully determined by density experiments nd the sizing of the fine and coarse aggregates should be uniformly maintained or the proportions changed to meet the arying sizes.

Relation of Cement and Aggregate.—For reinforced concrete onstruction a density proportion based on 1 should generally e used; i. e., one part of cement to a total of six parts of fine nd coarse aggregates measured separately.

In columns richer mixtures are often required, while for nassive masonry or rubble concrete a leaner mixture of 1:9, or ven 1:12, may be used. These proportions should be determined by the strength or wearing qualities required in the construction at the critical period of its use. Experienced judgment based on individual observations and tests of similar conditions in similar localities, is the best guide as to the proper proportions for any particular case.

The ingredients of concrete should be thoroughly mixed to the desired consistency, and the mixing should continue until the ement is uniformly distributed, and the mass is uniform in color nd homogeneity, since maximum density, and therefore greatest strength, of a given mixture depends largely on thorough and complete mixing.

Mixing.

Measuring Ingredients.—Methods of measurement of the proportions of the various ingredients, including the water, should be used, which will secure separate uniform measurements at all times.

Machine Mixing.—When the conditions will permit, a machine of a type which insures proportioning of the materials throughout the mass should be used since a more thorough and uniform consistency can therefore be obtained.

Hand Mixing.—When it is necessary to mix by hand the mixing should be on a water-tight platform, and special precautions should be taken to turn the materials until they are homogeneous in appearance and color.

Consistency.—The materials should be mixed wet enough to produce a concrete of such consistency as will flow into the forms and about the metal reinforcement, and which, at the same time, can be conveyed from the mixer to the forms without separation of the coarse aggregate from the mortar.

Retempering.—Retempering mortar or concrete, i. e., remixing with water after it has partially set, should not be permitted.

Placing of Concrete.

Methods.—Concrete after the addition of water to the mix should be handled rapidly, and in as small masses as practicable, from the place of mixing to the place of final deposit, and under no circumstances should concrete be used that has partially set before final placing. A slow-setting cement should be used when a long time is likely to occur between moving and final placing.

The concrete should be deposited in such a manner as will permit the most thorough compacting, such as can be obtained by working with a straight shovel or slicing tool kept moving up and down until all the ingredients have settled in their proper place by gravity and the surplus water has been forced to the surface.

In depositing the concrete under water special care should be exercised to prevent the cement from being floated away, and to prevent the formation of laitance, which hardens very slowly and forms a poor surface on which to deposite fresh concrete. Laitance is formed in both still and running water, and should be removed before placing fresh concrete.

Before placing the concrete care should be taken to see that the forms are substantial and thoroughly wetted and the space to be occupied by the concrete free from debris. When the placing of the concrete is suspended, all necessary grooves for joining future work should be made before the concrete has had time to set.

When work is resumed, concrete previously placed should be roughened, thoroughly cleaned from foreign material and laitance, drenched and slushed with a mortar consisting of one part Portland cement and not more than two parts fine aggregate.

The faces of concrete exposed to premature drying should be kept wet for a period of at least seven days.

Freezing Weather.—Concrete for reinforced structures should not be mixed or deposited at a freezing temperature unless special precautions are taken to avoid the use of materials containing frost or covered with ice crystals, and to provide means to prevent the concrete from freezing after being placed in position and until it has thoroughly hardened.

Rubble Concrete.—Where the concrete is to be deposited in massive work, its value may be improved and its cost materially reduced through the use of clean stones thoroughly imbedded in the concrete as near together as possible and still entirely surrounded by concrete.

Forms.

Forms should be substantial and unyielding, so that the concrete shall conform to the designed dimensions and contours, and should be tight to prevent the leakage of mortar.

The removal of forms is one of the most important steps in the erection of a structure of concrete or reinforced concrete. Care should be taken to inspect the concrete and ascertain its hardness before removing the forms.

As many conditions affect the hardening of concrete, the proper time for the removal of forms should be decided by some competent and responsible person, especially when unusual conditions are encountered.

Temperature Changes.

Concrete is sensitive to temperature changes and it is necessary to take this fact into account in designing reinforced concrete structures. In some positions the concrete is subjected to a much greater fluctuation in temperature than in others, and in such cases joints are necessary. The frequency of these joints will depend, first, upon the range of temperature to which concrete will be subjected; second, upon the quantity and position of the reinforcement. These points should be determined and provided for in the design. In massive work, such as retaining. walls, abutments, etc.. built without reinforcement. joints should be provided, approximately ,every 50 ft. throughout the length of the structure. To provide against the structures being thrown out of line by unequal settlement, each section of the wall may be tongued and grooved into the adjoining section. To provide against unsightly cracks, due to unequal settlement, a joint should be made at all sharp angles.

Portland Cement Products for Residences

Unlimited Scope Due to Improved Methods of Utilizing Concrete Variation of Design -- Practical Observations of a Contractor*

By Eugene G. Graves

While engaged in the contracting business a few years ago, I was impressed with the universal complaint of home builders at the high prices of lumber. Each time we moved to a new job, the owner invariably opened a discussion on the increasing expense of building materials. Pointing to some building on the premises, which had been built some ten or twenty years before by either himself or his father, he would quote us a price paid for lumber then, and would show that it seldom equalled more than one-half or two-thirds of the price which he was compelled to pay for that which we were framing. The lumber that we used was not only higher in price but was practically always of an inferior grade, as a result of grading by a lower standard—which was the natural outcome in the case of lumber, as is the case with any commodity which is constantly becoming harder to obtain.

The shortage of choice lumber for building purposes has caused various other kinds of lumber to spring into prominence in the market, and at prices that have increased directly as the supply of the choicest kinds has failed. We can only conclude from this that so long as we continue to substitute, from time to time, less satisfactory kinds of lumber for the better varieties, we shall gradually lower the standard of the principal element of construction in residence buildings.

General Substitute for Lumber

With this consideration in mind, many artisans in the building trades have been on the lookout for some general substitute for lumber as it is principally used in residence construction. One of the most desirable qualities of any substitute material is that it shall be fireproof. Also, besides being fireproof, the new building material should be one such that the best grades of it can be readily obtained at any shipping point so that its use can become universal in all localities. On account of the brief acquaintance which they have already made with it, the one material which suggests itself at once to many builders as embodying more than both of these requirements, is Portland cement.

It will be well at this time to remind the prospective builder that Portland cement is practically never used by itself as a building material. Technically, Portland cement is the finely pulverized product resulting from the calcination to incipient fusion of an intimate mixture of properly proportioned argillaceous and calcareous materials, and to which no addition greater than three per cent. has been made subsequent to calcination. Therefore, in referring to Portland cement as used in the construction of buildings, we will consider only Portland cement products. Such products or materials are obtained by adding more or less water to a mixture of Portland cement with an aggregate which is usually composed of sand, sand and lime, sand and gravel, sand and broken stone, or sand with gravel and cinders. Other aggregates are sometimes used, depending upon the purpose for which the resulting product is being made, and the abundance or scarcity of one or more of the materials just mentioned. Of most importance among Portland cement products are concrete, grout, cement mortar, and cement plaster. (Cement plaster, when used on surfaces which are exposed to the weather, is commonly called "stucco.") Concrete is used in building construction in the forms of monolithic concrete reinforced, monolithic concrete not reinforced, concrete blocks of many sizes and designs, concrete bricks, and concrete roofing tiles.

Heard from the Opposition.

Those builders who do not approve of the use of Portland cement products for building up the walls, enclosing, and roofing buildings for residence purposes, contend that such materials do not offer as great a range of variation in outward appearance as should be manifest in a town or city which is largely built up with flats or tenement houses and surrounded with suburban dwellings. They declare that when houses are walled with concrete or stucco, the possibilities of architectural design are practically lost, and that such houses bear a striking resemblance to each other, which is emphasized by a displeasing and inevitable "machine made" appearance. They refer conclusively to the fact that many of the first concrete houses were very damp on the inside at certain seasons of the year. And, finally, they turn to some experimental specimen of monolithic concrete construction, for which more lumber was probably used in the forms for moulding the concrete than would have been required to have framed the structure outright with dimension lumber, and complain that more lumber is required for building a concrete house than for a frame house. These three general criticisms practically represent the sum and substance of the prejudice that the concrete residence building confronts to-day.

The Other Side of the Story

On the other hand, men who have made a study of Portland cement products for building purposes, find that, with the improved methods for utilizing concrete, the number of designs obtainable for residence buildings is unlimited. They find that the inside of the exterior walls of a building, in which the walls, floor partitions, and roof are composed of concrete, may be as dry as if the whole structure were framed with wood. They inform us that, in practice to-day, the use of considerable quantities of lumber for form construction has been largely dispensed with in favor of patented forms for moulding monolithic concrete.. In addition to these points, they mention with much satisfaction the fact that, inasmuch as a concrete house requires no painting, is non-decaying, is fireproof and takes a lower rate of insurance, it is a far better investment than a house constructed principally of wood. Moreover, the fire insurance rates are considerably lower on concrete construction.

Such are the differences of opinion which one hears to-day on the uses of Portland cement products, and which, for discussion, we will narrow down to the following questions: (1

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*Extracted from the Cement World.

Do residence buildings which are constructed principally of Portland cement products necessarily bear a striking resemblance to each other? (2) Is it probable, that in such a residence building, the inside of the exterior walls will not be dry? (3) Is the use of a large amount of lumber necessary in the construction of a residence building in which the principal elements of construction are Portland cement products? (4) Is a residence building of this type a better investment than one constructed principally of wood?

There is hardly a community anywhere in the country but has some kind of building in which the experimental use of Portland cement is painfully apparent. Perhaps it is the result of the enthusiasm of some contractor who has not known before that concrete construction is a science in itself and is by no means a side issue. Or, it may be that some farmer attempted a hothouse of monolithic concrete ,or a silo of concrete blocks. In either case, such a structure offers to the opponents of Portland cement products a plausible argument, they believe, against the use of such materials. In a tone of derision they call our attention to one or more of these structures and criticize freely the clumsy proportions of them and consequent lack of expression in design. They do not mention the fact that the contractor or farmer who conceived the building was probably a man with such a poor sense of design that he could not have built a structure of a more pleasing appearance even though he had been given free access to a whole lumber yard. No. The examples that they refer us to are the results of the earliest experiments with Portland cement and are in no respect a criterion of present standards of concrete construction.

Wide Range in Field of Design

Portland cement products offer to-day an infinite number of variations in design. Depending upon the experience and ability of the builder, monolithic concrete, either reinforced or not, can be moulded with plain surfaces ,with indentations and offsets, or with panels and figures in relief. Concrete is moulded into building blocks of any desirable size, ranging in face measure from 4 inches wide by 4 inches high, to 16 inches wide by 16 inches high, and from 16 to 24 inches wide by 4, 6 or 8 inches high. The faces of these blocks are often moulded in many designs. Some are quarry faced, some panel faced, and some are moulded with special figures in relief. Besides having different sizes and shapes, and differently designed faces, they may be moulded in a variety of colours. To make white concrete, use one part white Portland cement, one-fourth part pulverized lime, one-half part pulverized marble, and one part light colored sand; for red concrete, use one sack of Portland cement with 200 pounds of sand and five pounds of violet oxide of iron (raw), and in a similar manner bright red, brown, dark blue, gray, and black colors may be obtained. In addition to these qualities, concrete can be moulded into any special shape desired for ornamental purposes.

Still another form of concrete [illegible] important part in architectural design, is the concrete roofing tile. Tiles, again, may be made in a [illegible] shape and size. We [illegible] residence building principally of Portland cement products, the builder may, if he chooses, build the entire structure in one monolithic unit or from a [illegible] These may be used in any one of a large range of colors, or they may be worked out by a definite color scheme comprised of an assortment of colors; and, in addition to this, either the one great piece of [illegible] of unit pieces, can be moulded in the design of [illegible] infinite number of the designs of classic architecture.

Are we to believe, then, that such a building can have no variation of architectural treatment? [illegible] a group of them could [illegible] of design?

Reinforced Concrete Sewer Pipe

By Owen McKay, Walkerville, Ont.

Last season I was employed by the council of the town of Sandwich to prepare plans and specifications for a sewer on Bedford street and also a main outlet sewer from Bedford street, on Park street, across the marsh to the channel bank of the River Detroit, which should have sufficient capacity to afford an outlet for a sewer system, comprising about 200 acres in the southerly portion of the town. As a large portion of this outlet sewer was laid through a marsh, a few remarks on the subject may prove of interest.

About 540 feet of this main outlet, west of Bedford street, was laid on dry land, 1,400 feet in a marsh, and 200 feet in water, including the timber box culvert. The marsh soil consisted of from one to three feet of peat or bog soil, overlying clay subsoil, and covered with water to the depth of from 8 inches to 24 inches at the ordinary summer level.

I recommended a two-ring brick sewer, 48 inches internal diameter, from Bedford street to the edge of the marsh, and as brick would be unsuitable for sewer construction in the marsh itself owing to the fact that it would be submerged at greater or less depths, I decided on recommending a Jackson reinforced concrete pipe sewer, 48 inches internal diameter, as manufactured by the Jackson Concrete Pipe Company, Jackson, Mich.

The sewer pipe is strongly reinforced by No. 9 wire, also heavy longitudinal and transverse iron bands. These longitudinal bands, cause the pipes, where laid, to interlock one with the other and thus make a perfect bond after the joints are cemented.

The pipes were made on the ground, as close to the work as circumstances would permit, by setting up the steel forms of the proper radius, oiling them well to prevent the concrete from adhering to the steel, and pouring the concrete into the form and carefully tamping the same, thus ensuring the work being done under proper inspection. After the concrete had been allowed to set, the forms were removed and the process repeated until the pipes were all made.

After the work was completed in the marsh, the pipes were laid in the water, out 125 feet from the beach, in a similar manner, excepting that a line of sheath piling was driven on each side to prevent the wash, from passing boats or high winds, from undermining the pipes. By this method we got an almost perfect sewer, the pipes being all interlocked and the socket joints filled with cement mortar 1 to 2 and brushed on the inside with neat cement. The concrete pipes being moulded in steel moulds, had a very smooth surface and will make a perfect sewer carrier. The concrete in the sewer pipe was mixed in the proportion of one part Portland cement to 5 parts of clean, coarse lake gravel.

I believe that concrete will soon supercede all forms of material for sewer construction for the larger size of sewers, say from two feet in diameter and upwards. It would, however, be an improvement if manufacturers would make egg-shaped concrete pipes as well as circular shapes for the large sizes.

I am also of the opinion that better results will be obtained by making the pipes in moulds on the surface, laying them in the trenches after they have been properly cured, and cementing the joints, owing to the fact that the interior surface will be smoother and of more uniform shape and size than if the sewer were constructed [illegible]

[illegible]

[illegible] 10.00

An Attractive Concrete Block Residence

The accompanying illustration is that of a comfortable suburban home in Bowmanville, Ont., owned by Mr. F. A. Foster. This house is a fine example of what can be done with concrete. The main structure is built of concrete blocks made on the London face-down, adjustable concrete block machine. The sills, steps, window-heads, porch columns, balusters and all exterior cement ornaments are made on moulds manufactured by the same firm. Mr. Foster purchased the machines and moulds himself, and had the products made on the ground, where the structure was erected under his own supervision.

The foundation of this structure was built with 12-inch concrete blocks having a 3½-inch core opening, the first storey, built with 10-inch concrete blocks, having a 2½-inch core opening, and the second storey, built of 8-inch concrete blocks, having a 2½-inch core opening. It will be noted that these sizes of core openings are smaller than are generally used, but we commend Mr Foster for using a block of this description and thus ensuring a solid wall. Contractors everywhere are beginning to realize that in the past too much has been expected from the concrete block as far as crushing strength is concerned, and in many cases buildings have been erected where the walls have been much too light. Too large a core opening has been used in the block, which has resulted in unsightly cracks in the wall. Architects are now demanding that concrete blocks shall have a more moderate sized core opening, giving a greater bedding surface for the block, and the sooner the block maker learns that he must meet the architectural requirements, the sooner the concrete block industry will become worthy of recognition.

A View of the Attractive Concrete Block Residence Erected by Mr. F. A. Foster, of Bowmanville, Ont.

Reinforced Concrete Columns

The question of cost is paramount in deciding between the use of concrete columns and steel fireproofed columns for buildings having floors and frame of reinforced concrete. This is a question to be settled for each structure.

Theory indicates that a concrete column reinforced with longitudinal rods or bars will be strengthened by the steel in proportion as the areas are influenced by the ratio of deformation of the steel and concrete. This ratio is preferably named by Professor Talbot "the ratio between steel stress and concrete stress"; if a concrete is selected, such that 500 pounds per square inch is considered a safe working stress, then with a stress ratio of 15 the steel stress will be 15 × 500 = 7,500 pounds per square inch. The uneconomical use of the steel is manifest and theories of column reinforcement have not been confined to an endeavor to make the ratio smaller. Strangely enough, the idea has been to use more steel, so placed that it will confine the concrete, to permit of the use of higher stresses.

Here and there experimenters have announced that by using a better concrete, higher stresses might be used in this material, with a lessening of steel. This opinion has been gaining in force, until at the recent convention of the National Association of Cement Users, Professor Gillespie, of Toronto University, presented a paper which will go far towards settling the matter. Professor Gillespie advocates a rich, dense concrete for columns and the longitudinal reinforcement is used merely to guard against possible flexure and to provide toughness to resist shocks. In the discussion some question was raised as to difficulties that might be encountered in securing in actual work as good a concrete as was obtained in the laboratory.

The objectors lost sight of the speaker's point that cement is the cheapest and most efficient reinforcement for columns. Professor Withey, of the University of Wisconsin, showed this very plainly. Professor Berry, of the University of Pennsylvania, within the past few weeks demonstrated the fact that reinforcement adds very little to the actual strength of concrete, the function of reinforcement being principally to guard against sudden failure. Manufacturers of reinforcing for columns publish results of tests to prove that spiral reinforcement wonderfully strengthens columns, but always the fact appears that the best results occur with the best concrete.

Flexure does not enter. Building ordinances limit the ratio of l/d, and the case is one of compression pure and simple. Professor Gillespie proportioned his concrete by weight, 70 pounds of cement and 70 pounds of trap rock from ⅛-inch to ¾-inch, making 1 cubic foot of concrete, with the necessary water. The comparative costs given in his paper show how much can be spent on cement and how materially the cost is reduced by comparison with a highly reinforced column of leaner concrete. There should be little difficulty in securing in actual building operations a concrete having an ultimate strength of 4,000 pounds per square inch and over by paying some attention to grading of aggregates. Such concrete it would be sinful to wrap in wire bands.

Official Details of the Cement Convention

Programme of Arrangements for the Second Annual Meeting of the Canadian Cement and Concrete Association Additional Information of Interest

The finishing touches have yet to be put upon the details for the second annual convention and exhibition of the Canadian Cement and Concrete Association, but the following may be accepted as the substance of the official programme. Judging by the range of subjects covered by the papers, the convention should be a most interesting one, and there is every reason to believe that the exhibition will be most successful. A rumor is heard that the next convention will be held at either Montreal or Winnipeg. It would seem particularly desirable to choose the former city. It is important in the interest of the Association to clean up the work in Eastern Canada before entering upon that in the west, which will be found comparatively easy in proper course.

Tuesday, March 29th

2.30 P.M.

Annual Address by the President, Peter Gillespie, Lecturer in Theory of Construction, University of Toronto.

"Concrete Construction"—Cecil B. Smith, of Smith, Kerry & Chace, consulting engineers, Toronto, Winnipeg and Calgary.

"Use of Concrete in Dwelling-House Architecture"—Ernest Wilby, Architect, Detroit, Mich. (Paper to be read by the Secretary).

"Waterproofing of Concrete"—R. A. Plumb, chemist, Detroit, Mich.

8.00 P.M.

"Use of Cement in Architecture"—F. S. Baker, President Royal Architectural Institute of Canada.

"What Concrete Means to the Farmer"—Percy H. Wilson, secretary of the Association of American Portland Cement Manufacturers, Philadelphia, Pa.

"Inexpensive Homes of Concrete"—M. D. Morrill, architect, Washington, D.C. (Paper to be read by the Secretary).

Wednesday, March 30th.

10.30 A.M.

Discussion of Proposed Standard Specifications.

2.30 P.M.

"Concrete Bridges"—A. W. Connor, of Bowman & Connor, consulting engineers, Toronto.

"An Analysis of Concrete Bridge Failures"—C. R. Young, of Barber & Young, bridge and structural engineers, Toronto.

"Concrete Roadway Construction"—C. W. Boynton, Chief Inspecting Engineer, Universal Portland Cement Company, Chicago, Ill.

"Concrete"—James Bell, of Bell & McCubbin, civil engineers, St. Thomas, Ont.

8.00 P.M.

"The Engineer and the Finished Work"—A. W. Campbell, Deputy Minister Railways and Canals, Ottawa.

"Construction of Concrete Highway Bridges"—Chas. Talbot, County Engineer of Middlesex, London, Ont.

"Concrete Pavements"—James Pearson, [illegible] Constructing & Paving Company, Toronto.

Thursday, March 31st.

10.30 A.M.

Election of Officers.

2.30 P.M.

"Concrete in Europe"—Richard L. Humphrey, President National Association of Cement Users, and Director United States Structural Materials Testing Laboratories, Pittsburg, Pa.

"Some Experiments with Cement Tile"—W. H. Day, Professor of Physics, Ontario Agricultural College, Guelph, Ont.

"Uses of Concrete on the Farm"—Philip L. Wormeley, Testing Engineer, Office of Public Roads, United States Department of Agriculture, Washington, D.C.

"Hardening of Portland Cement"—A. G. Larson, chemist, Grey & Bruce Portland Cement Company, Owen Sound, Ont.

8.00 P.M.

Annual Dinner of the Association at the Tecumseh House.

Friday, April 1st

2.30 P.M.

"Government Testing Laboratories"—Richard L. Humphrey, President National Association of Cement Users, and Director United States Structural Materials Testing Laboratories, Pittsburg, Pa.

Professor Gillespie, Toronto, President Canadian Cement and Concrete Association.

"Commercial Aspect of Reinforced Concrete in Canada"—Gustave Kahn, general sales manager, Trussed Concrete Steel Company of Canada, Toronto, Ont.

"What the Concrete Block Means to Canada"—J. Augustine Smith, secretary and sales manager, Ideal Concrete Machinery Company, South Bend, Indiana.

"Concrete from the Contractors' Standpoint"—D. C. Raymond, vice-president, Bishop Construction Company, Montreal and Toronto.

General Information

Reduced Railway Rates.—The Eastern Passenger Association have granted reduced fares on the certificate plan to delegates attending the convention. Delegates will purchase at their home station one-way tickets to London, obtaining at the same time from their local agents receipt on a Standard form for the amount so paid. These receipts, when validated by the secretary of the Canadian Cement and Concrete Association, will entitle the holders thereof to return tickets [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] certificates be pre-

[illegible]. A charge of 25 cents is made by the Eastern Canadian Passenger Association for the service of issuing the return ticket. A representative of the railways will be present at the Exhibition Hall, Princess Rink.

The Exhibition

The municipality of London has kindly placed at the disposal of the Association the spacious Princess Rink, where interesting exhibits may be seen illustrating processes, products and machinery connected with the various uses of cement and concrete.

Among the exhibitors who have applied for space up to the time of going to press are the following:

Wetlaufer Bros., Toronto.
John T. Hepburn, Toronto.

Mr. R. E. W. Hagarty, Toronto, the energetic secretary of the Canadian Cement and Concrete Convention.

Scott Machine Company, London.
Somers Bros. Manufacturing Company, Urbana, Ill.
Rapid Cement Machinery Company, St. Paul, Minn.
Crapp Concrete Machinery Company, Chicago, Ill.
E. E. Benner, Chicago, Ill.
Diamond Concrete Machinery Company, Chicago, Ill.
Merillat Culvert Core Company, Winfield, Iowa.
W. R. Goit Company, Limited, Fort Erie, Ont.
C. S. Wert, Kendallville, Ind.
Trussed Concrete Steel Company, Walkerville, Ont.
Ideal Concrete Machinery Company, London.
London Concrete Machinery Company, London.
Dennis Wire & Iron Company, Limited, London.
Roman Stone Company, Toronto.
United States Gypsum Company, Chicago, Ill.
Down Draft Furnace Company, Galt, Ont.
W. J. Anthistle, London.
Canada Foundry Company, Toronto.
Alfred Rogers, Toronto.
Canadian Art Stone Company, Toronto.
Peerless Cement Brick Company, Toronto, Ont.
London Engine Supply Company, London, Ont.

London Hotels

Tecumseh, Richmond street, near G.T.R.	$2.50 per day
Grigg House, Richmond street, near G.T.R.	2.00 per day
City Hotel, cor. Dundas & Talbot streets	1.50 per day
London House, cor. Dundas & Talbot streets	1.50 per day
Dominion House, cor. York & Clarence streets	1.50 per day
Fraser House, King street	$1.25 and 1.50 per day

Leading Canadian Contractors

Mr. Paul T. C. Dumais, civil engineer and contractor, of Hull, Que., who contributes an interesting article to this issue, was born at Kamouraska, Que., on January 2nd, 1847. He graduated at Ste. Anne College in 1864, and from the Quebec Military School in 1866. His first professional experience was obtained in 1866 and 1867 as assistant engineer on U. S. Harbor Improvement, Lake Michigan. Upon the termination of this work, Mr. Dumais went to Europe, and from 1868 to 1870 took active service in the regular army in Italy, retiring with the rank of sergeant. Returning to Canada, Mr. Dumais engaged in land surveying, in Quebec, from 1871 to 1878. In the latter year he was admitted Provincial Land Surveyor. Four years later he qualified at Ottawa as a Dominion Land Surveyor. Following this he was engaged on local and government survey work.

In 1885-6 he was chief engineer on the construction of the Temiskaming Colonization Railway. From 1899 to 1802 he was working upon land, hydrographic and underground surveys in the Yukon. Since then he has confined his labors almost exclusively to general contracting. During the last few years he has carried out several important harbor works on the St. Lawrence river. In 1906 and 1907 Mr. Dumais obtained Canadian and United States patents for a new and improved system of reinforced concrete construction for piers, bridges, wharves, coffer dams and tunnels, concerning which detailed information is given elsewhere.

Mr. Paul T. C. Dumais, a prominent engineering-contractor of Hull, Que.

The members of the Winnipeg Builders' Exchange meet every Friday evening for a card party and social time. A regular card tournament is under way and prizes will be awarded for cribbage, pedro and bridge. Single prizes will be given for cribbage, and in pedro and bridge, team prizes will be given. A big smoker is planned for this week, when the prizes will be awarded to the successful rinks in the builders' bonspiel, lately concluded. The president, Mr. W. H. Carter, is donating a beautiful cup in this connection.

LEGAL DEPARTMENT

Information for this Department is requested from Architects, Engineers, Contractors and Builders. Send in the particulars of recent cases in which you were interested giving the main facts tersely.

Improper Use of Trademark—The appeal brought by the Standard Ideal Company, of Port Hope, Ont., from the decision given against them and in favor of the Standard Sanitary Manufacturing Company, of Pittsburg, Pa., in a lower court, by Mr. Justice Archibald, has been decided with costs against the Canadian company. In the first action the court held that the defendants, the Canadian company, had advertised their goods as "Standard" with intent to deceive the public. The judgment appealed from was confirmed by the higher court, the defendants being restrained from using the word "Standard" in connection with enamelled bathtubs, wash stands, lavatories, sinks, laundry trays and other articles of toilet use, and their attachments, either by stamping, circular, advertising or other form of designation.

Incurring Risk Voluntarily.—Kimball v. Butler Bros.—This was an appeal by the plaintiff from the judgment of the Divisional court dismissing the action. The plaintiff, the widow of Wallace Kimball, deceased, brought action to recover damages for the death of her husband while in the employment of the defendant, under circumstances of alleged negligence on their part. The deceased was a civil engineer and held the position of superintendent of shaft No. 2, in the construction of a tunnel under the Detroit river. A fire occurred in shaft No. 4 and deceased voluntarily went down with others to extinguish the fire and assist in the rescue of workmen. In doing so he lost his life, and the present action for damages resulted. The plaintiff claimed negligence on the part of the defendants in not maintaining proper supervision of the work, in adequate superintendence, and in the absence of the proper appliances for extinguishing fire, as well as in not providing sufficient ways of egress from the shaft. The court found that the deceased was not empoyed where the fire occurred, that he acted deliberately, with a knowledge of the risk he was incurring, and that the defendants were not liable. The judgment of the Divisional court was accordingly affirmed.

Delay in Completing Contract.—Findlay v. Stevens. Divisional Court of Ontario. The plaintiff, a contractor, brought action for balance alleged to be due for the slating of a roof. The defendant counter claimed for damages, alleging that the work was not completed within the specified time. The contractor, Findlay, agreed to carry out the slating and tiling work by a certain date for a certain sum. If he could not finish the work within the stated time he was to be discharged by the architect. By another [illegible] provision was made that when other contractors were employed on the work, each should be responsible for loss caused by failure to finish the work at the proper time, and that any contractor suffering damage should call the attention of the proprietor to the fact. It [illegible] that if the contractor should fail to finish the work at the proper ime he should be subjected to a penalty of $1 per day during the time that the work remained uncompleted, due allowance to be made for the extension of time for additional alterations and for delay occasioned by the default of other contractors for other parts of the work. It appeared that the carpenter's work was not done on the roof until after the time specified for the completion of Findlay's contract.

The court held that the contractor was not liable to the penalty owing to the fact that he was delayed by the proprietor's workmen. The penalty clause was at an end when the contract limit expired and was for the specific period only.

The architect has power of extension during the currency of written contracts, but not thereafter. These powers, however, do not affect the duration of the contract as to its time limit; the work is still to be done within the given limit, and beyond that the term as to penalties is not to be carried into any subsequent unwritten contract for the work.

Damage Caused by Defective Sprinkler Tank.—Hees vs. Ontario Wind Engine & Pump Company. Court of Appeal. Plaintiff entered into a contract with the defendant company for the erection of a 40,000 gallon sprinkler tank to be used in connection with their factory. When the sprinkler tank was completed it was partially filled with water, whereupon the structure erected by the defendant collapsed and the tank and structure fell against the defendants' factory, causing consierable destruction. Plaintiff claimed $18,000 damages. The defendant company contended that the damage was caused by the improper interference of plaintiff in filling the tank before it should have been filled. At the previous trial judgment was given plaintiff for damage sustained and costs. The Court of Appeal dismissed the appeal with costs.

Payment for Work and Materials.—In the action, Gamble vs. Arnold, in the Saskatchewan Court, the plaintiff, assignee of the Kelly Plumbing, Heating and Light Company, Limited, brought action on a promissory note for $529.50, an itemized account for work done and material supplied for $554.59, both being for furnishing in the Wascana Hotel, owned by the defendant. The defendant was unable to show that it was part of the agreement that no payment should be made except on production of certificate from the architect. The court found that the evidence of the architect did not go further than to show that he was to supervise the work, and that it was plainly by mere inference that he added that the certificate was required. Evidence of the materials having been supplied and the work performed was found sufficient. Judgment was given plaintiff for $663.16.

The Universal Portland Cement Company, Chicago and Pittsburg, have favored us with a copy of an interesting work entitled "Representative Cement Houses." The descriptive matter contained in this book will be of great interest to the [illegible] architect and contractor. The variety of designs illustrates the wide possibilities of cement residence construction. The editors have divided the subject into five classes, the first embracing the various forms of reinforced concrete houses, including the monolithic types; the second including the cement block or hollow tile structure with a coat of cement plaster on the exterior; the third, the plain cement block or tile structure with no exterior coat of plaster; the fourth, that with a frame structure of wood, with an exterior coat of cement plaster; and the fifth, cement brick houses. The practical information and cost data contained in this little work will meet a long-felt want for accurate and definite particulars as to what can be done in the way of cement house construction.

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Personal News and Notes

Assistant City Engineer Scott, Toronto, has received a tempting offer to leave the city, but it is understood that he has no intention of severing his present connection.

Mr. Henry Brown, mechanical engineer of the Missisquoi Marble Company, Quebec, has resigned that position, having obtained a charter to operate as the Dominion Marble Company, with offices and works at South Stukely, Que.

At a meeting of the Toronto Carpenters' Union held last Saturday the members decided to turn down the builders' offer of 35 cents an hour. A committeee was appointed to negotiate for 40 cents an hour, 7 cents higher than the present schedule.

A report from Halifax, N.S., states that the representative of a large English cement manufacturing concern has been investigating the Maritime Provinces as a future field for establishing cement works, to be operated independently of the Canadian merger.

Mr. Mason H. Baker, of St. Thomas, Ont., has been appointed assistant city engineer of that city at a salary of $1,200 a year. Mr. Baker assumes his position with the prospect of being appointed city engineer at the end of the year in succession to Mr. Jas. A. Bell, who is resigning.

The premises of the Engineers' Club of Toronto, at 96 King Street West, are to be remodelled and ready for opening by the first of May. The new social club will provide billiard-rooms, bowling-alleys, lecture room, technical library, grill-room and general dining-room.

The Barron & Cole Company, of New York City, owing to the increased demand in second hand contractors' equipment, are opening up a special department to handle this particular line, and have put Mr. George E Ray, formerly of the Russell Contracting Company, also of New York, in charge, as manager.

City Engineer Rust, Toronto, has received from the United States photographs of a power tamping machine which does away with manual labor in the pounding of earth in trenches. The machine is so constructed that a heavy pounder can be hoisted or dropped automatically and restore the excavated earth to its former solid condition. Mr. Rust will write for more particulars about the construction of the machine, and may recommend that one be purchased for his department.

The following are some of the applications received for the position of city engineer of St. Thomas, Ont., together with the remuneration asked for. The information may be of interest in that it throws some light upon the salaries obtaining and expected in municipal work: S. D. Egan, late of Chatham, Eng., gold medallist, experience in England, New Zealand, South Africa and Canada, $1,200; E. P. Phillips, Toronto, 1906, since town engineer of Oshawa and Bracebridge, $1,200; J. M. Wilson, Toronto, assistant waterworks engineer at Toronto, $1,800; E. R. Blackwell, Mem. Can. Soc. C.E., general experience since 1882, $1,500; Alex. Lindsay, since 1905 assistant city engineer of Spokane, Wash., $1,800; M. T. Meadowcroft, municipal experience in Chicago and other places, $1,500; G. A. Ball, Toronto, English B.Sc., experience in England, $960; Mason H Baker (the successful applicant), late of the Saskatoon Public Works Department, $1,200.

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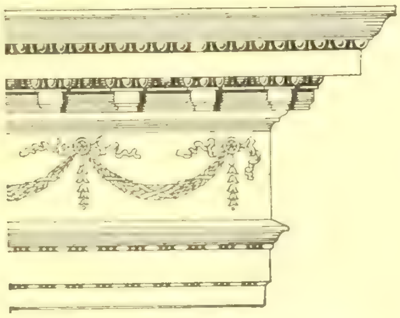

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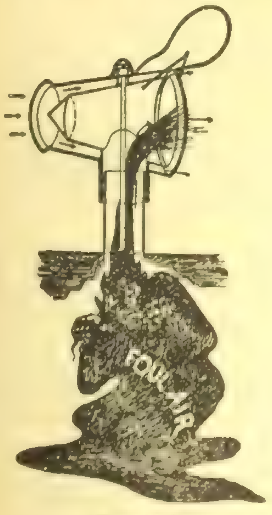

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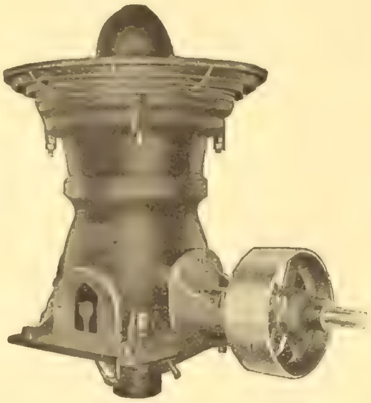

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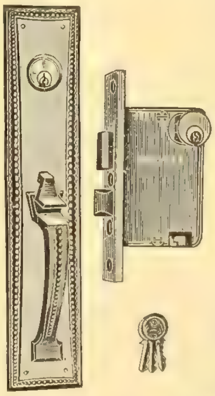

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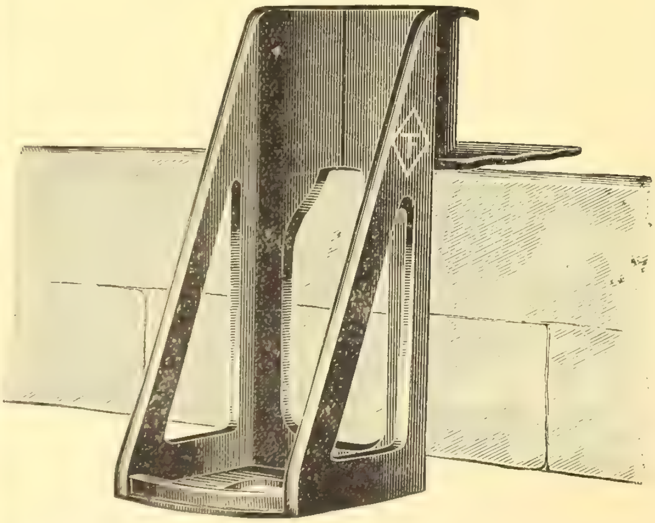

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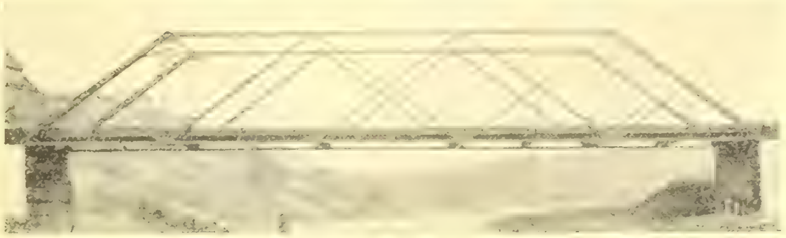

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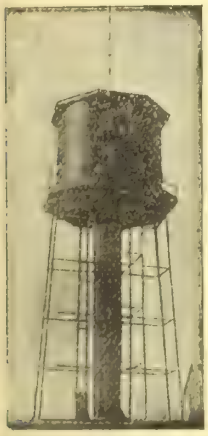

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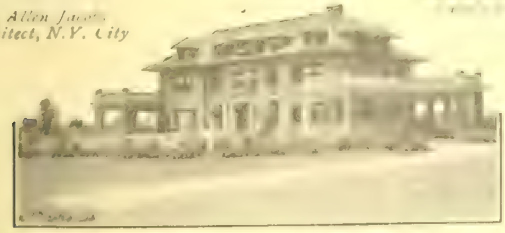

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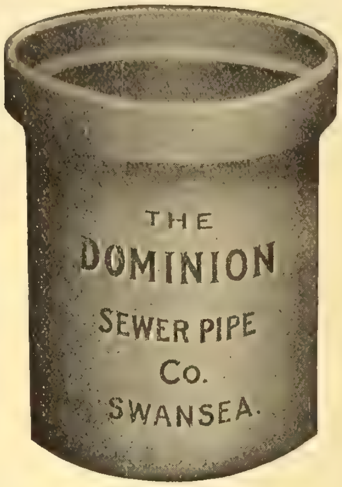

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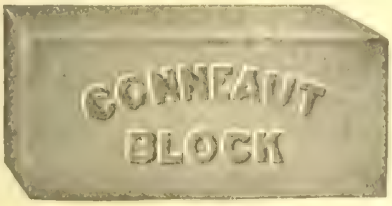

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41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
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40 u. i.......	4.25	3.75	7,25	5.50
50 u. i.......	4.75	4.25	8.75	6.50
60 u. i,......	5.00	4.75	10.00	7.50
70 u. i.......	5.25	5.25	11.50	8.50
80 u. i.......	5.75	6.00	12.50	9.50
85 u. i.......	....	....	14,00	10.50
90 u. i.......	....	....	16.50	11.50
95 u. i.......	.,..	....	18.00	13.50
100 u. i.......	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

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(Prices f.o.b. Toronto.)

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Floor Tile—½-inch square 45 cents.
Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 25 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish colors, firsts 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G, Cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

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Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock.........net	$1.65
No. 4½ Fuller's ....net	2.25

Square head brass cocks, 55; iron, 60 per cent.

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Furnaces 45 per cent.; registers 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.; other specials, 40 per cent.

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30-gallon, standard, $4.75; extra heavy, $7.00.

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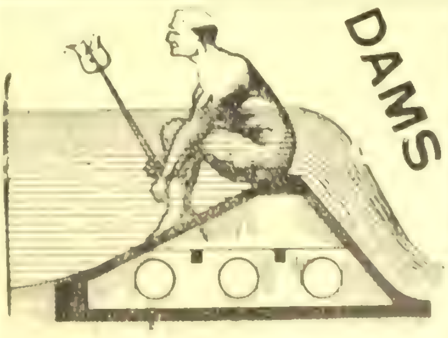

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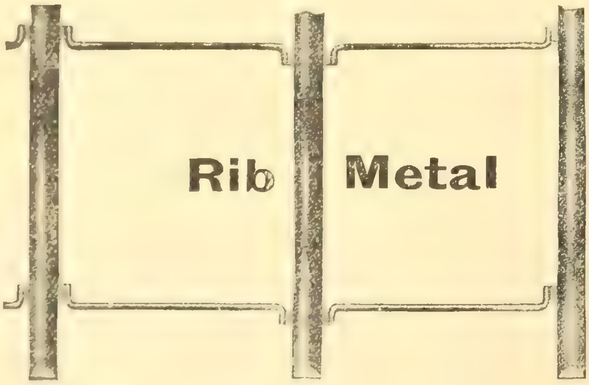

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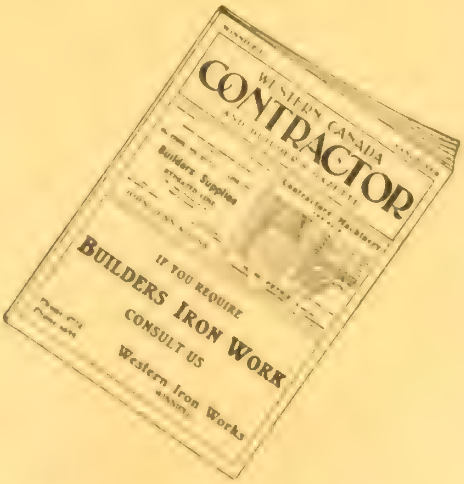

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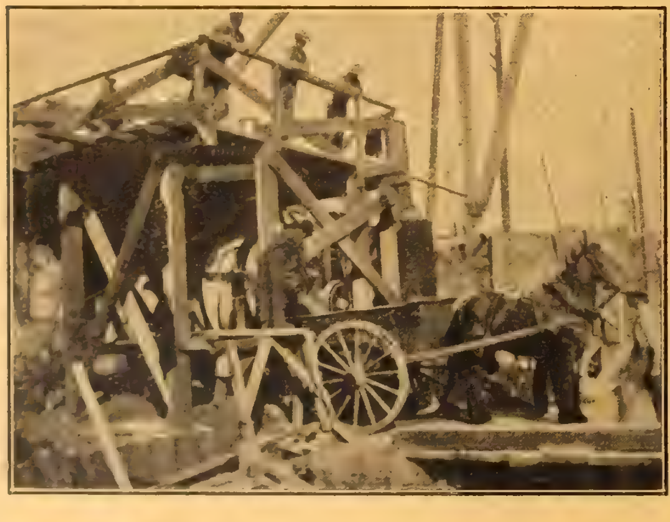

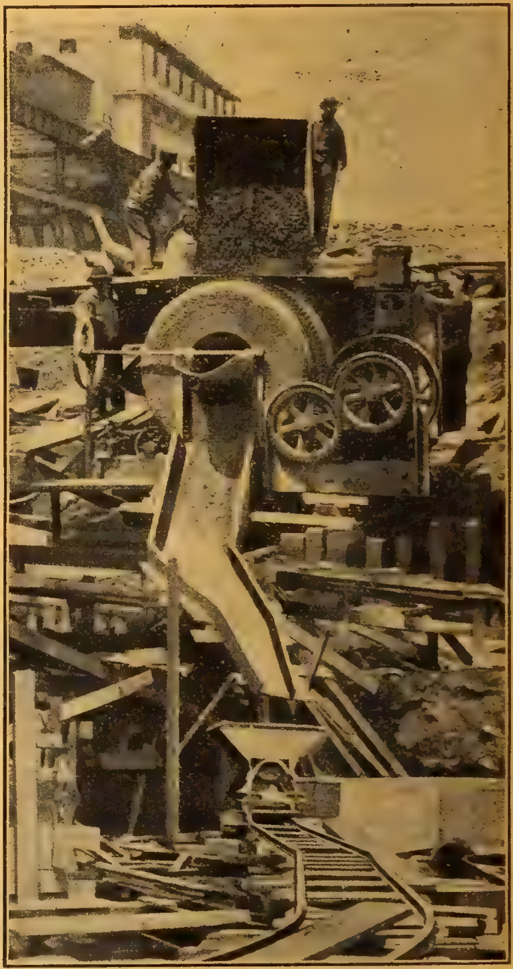

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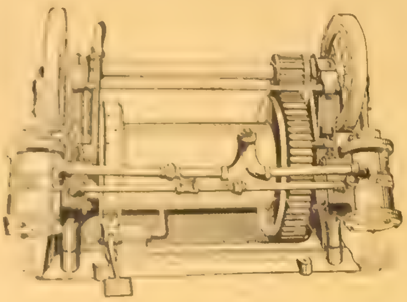

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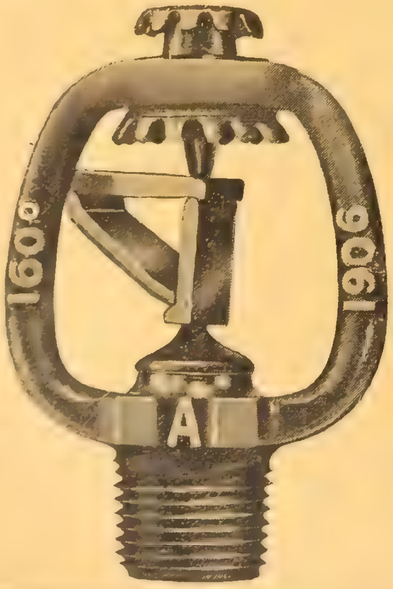

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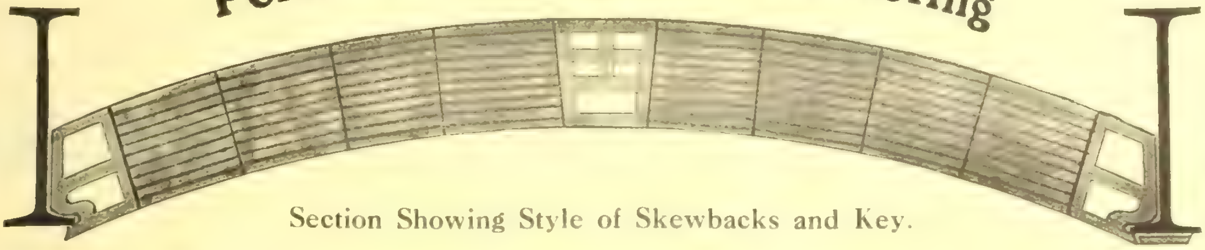

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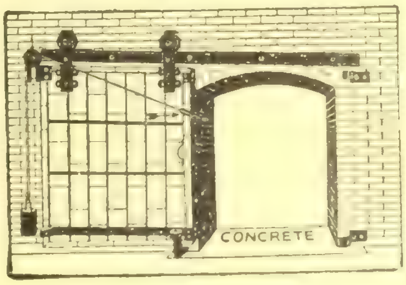

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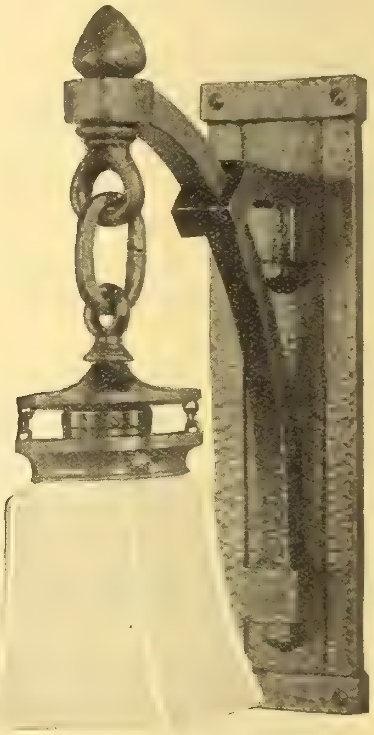

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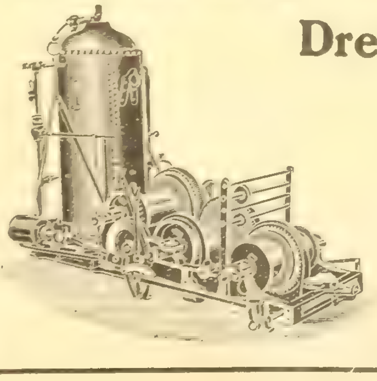

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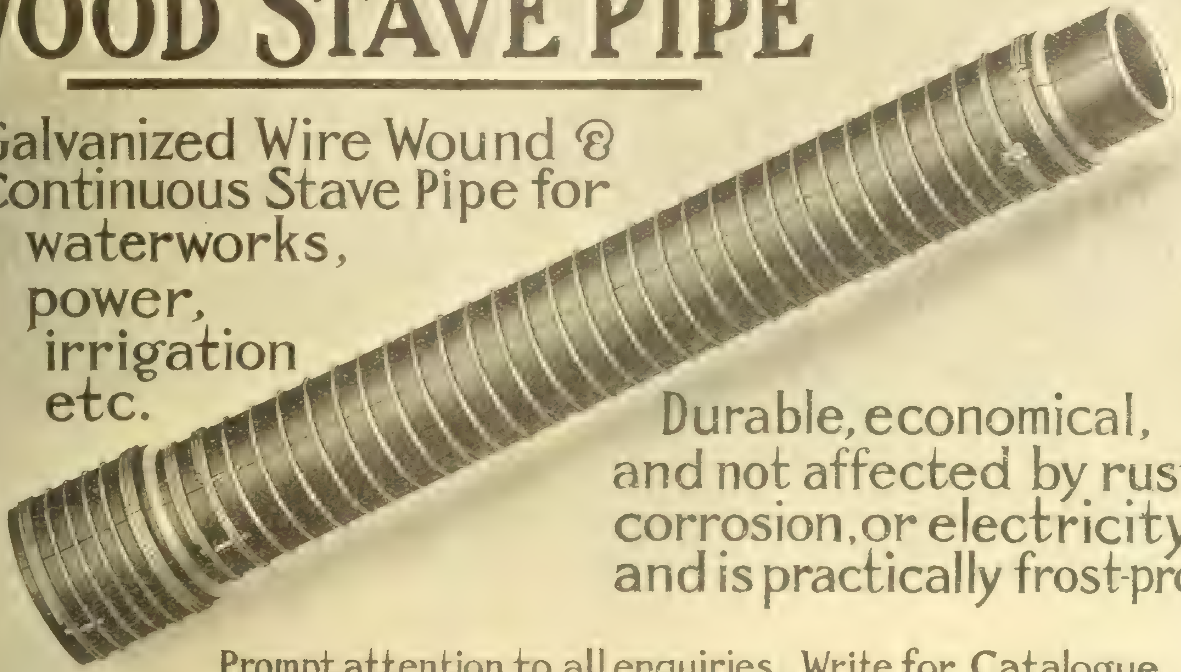

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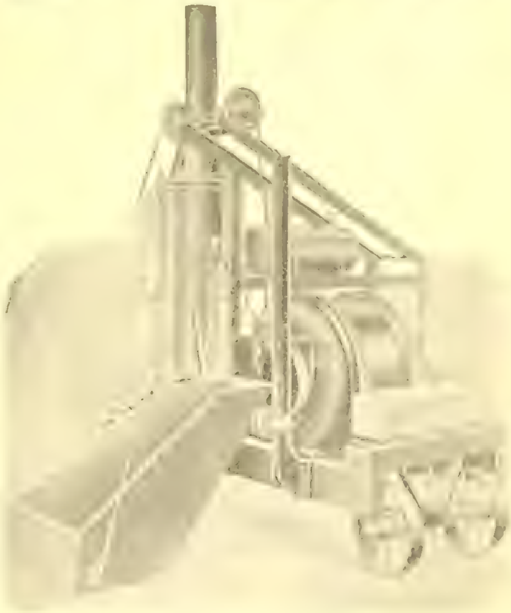

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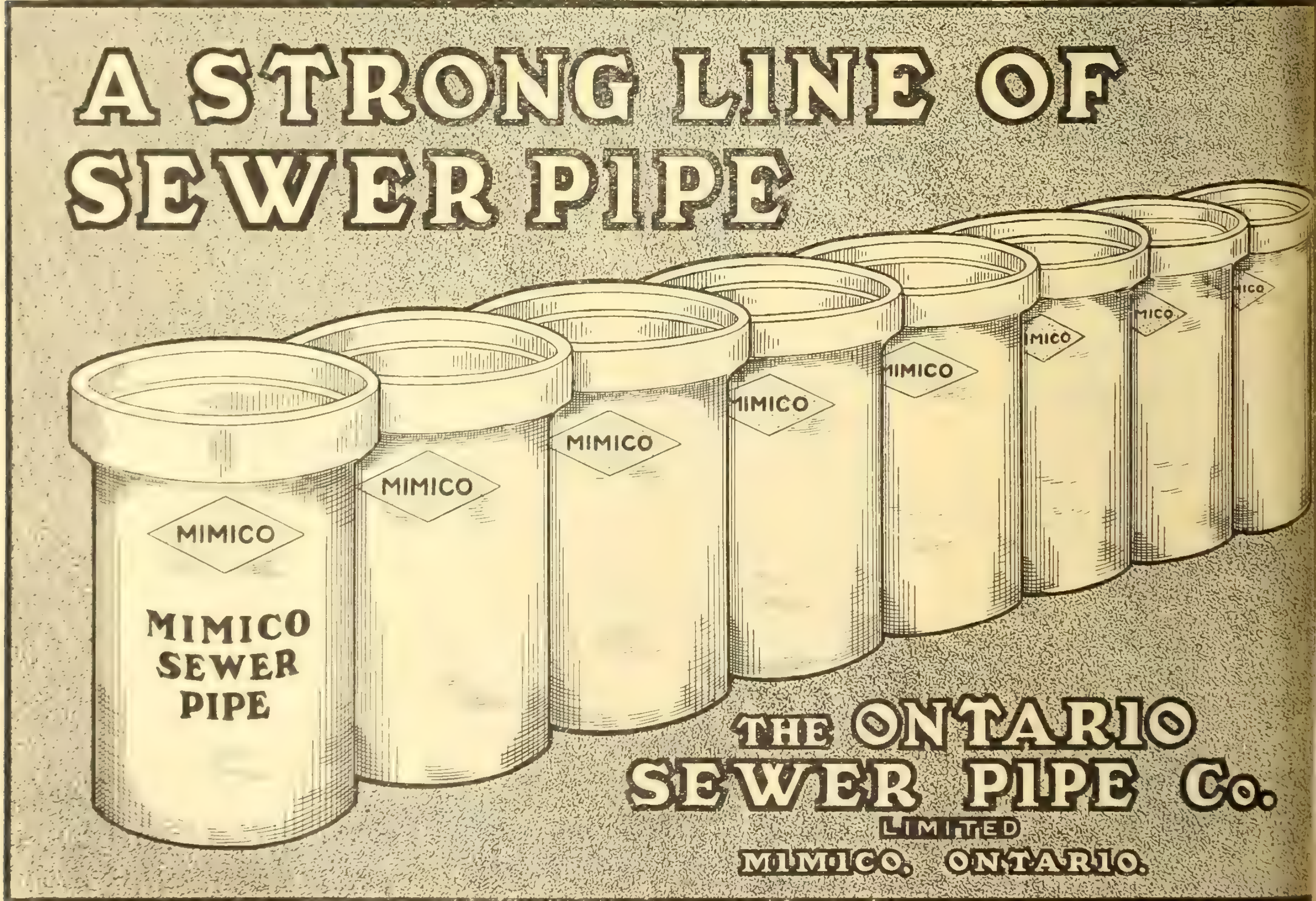
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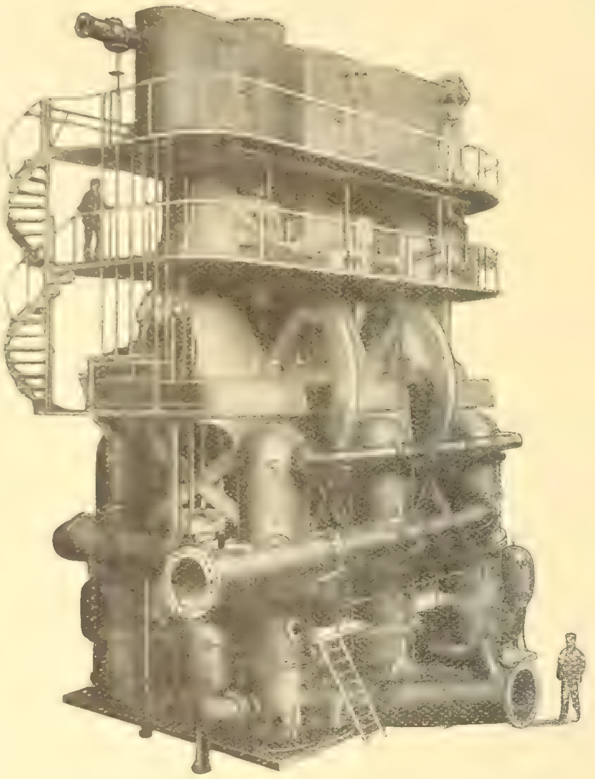

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Kingston, Ont.	"	4 "
Woodstock, Ont.	"	4 "
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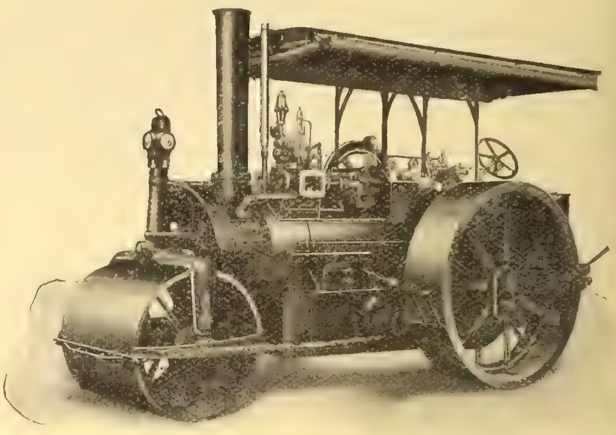

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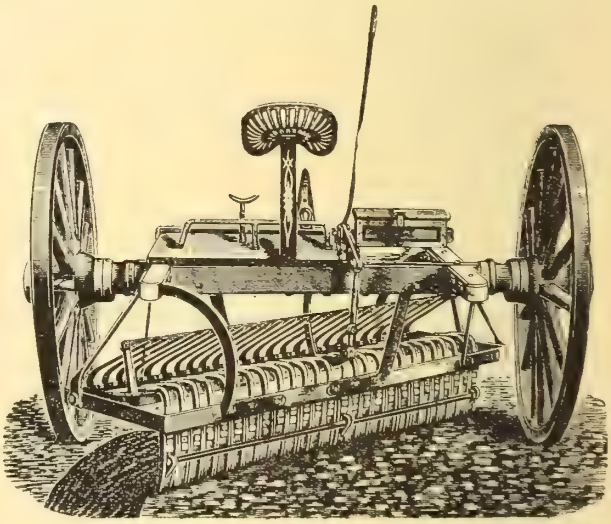

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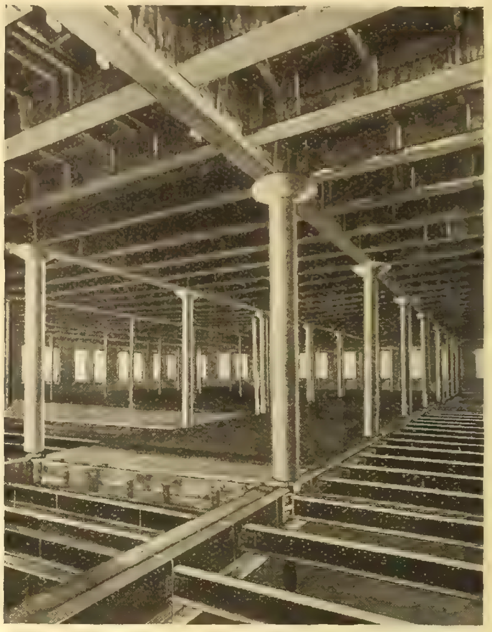

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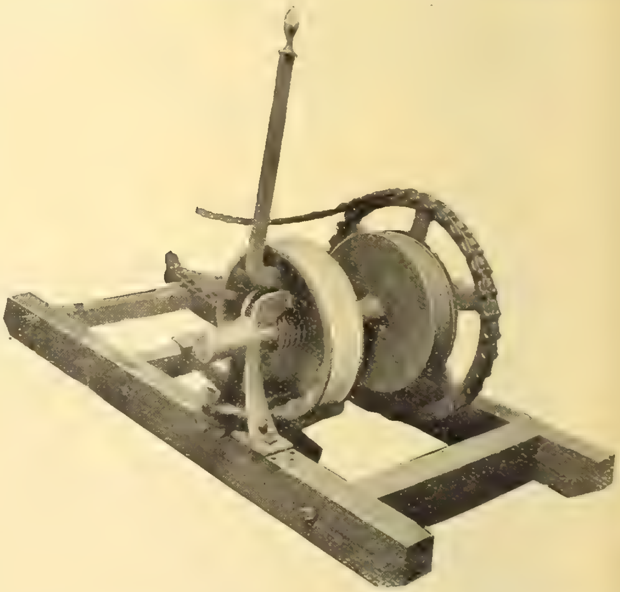

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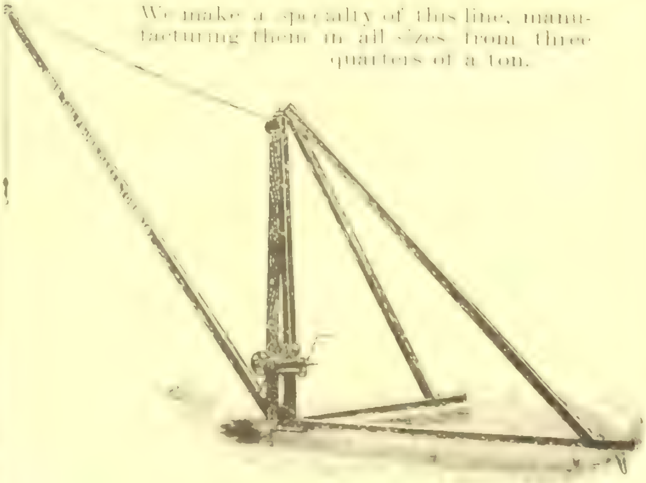

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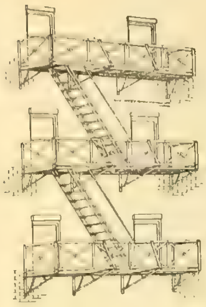

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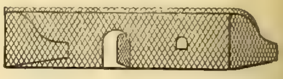

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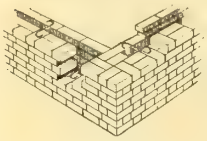

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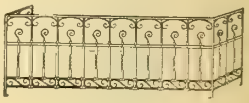

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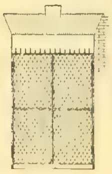

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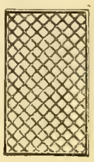

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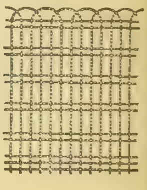

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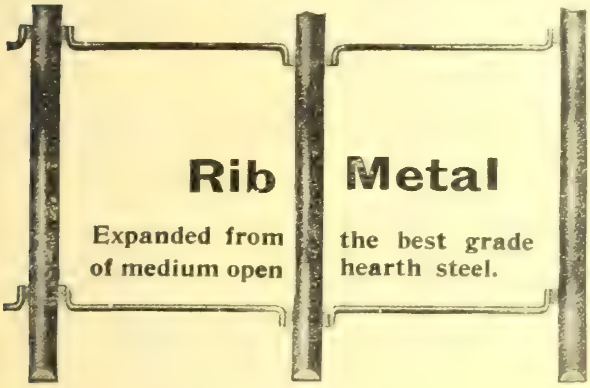

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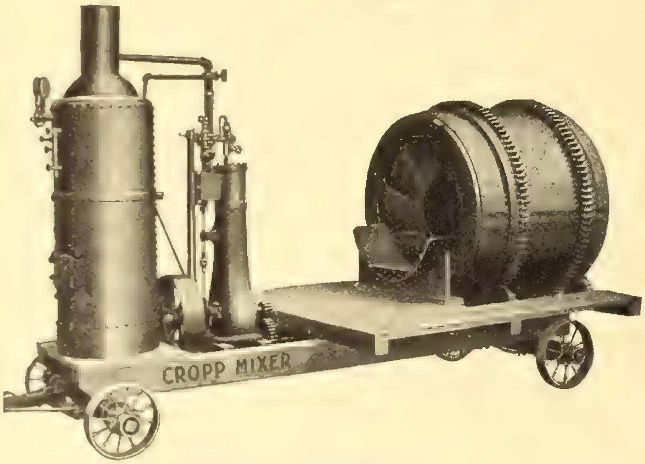

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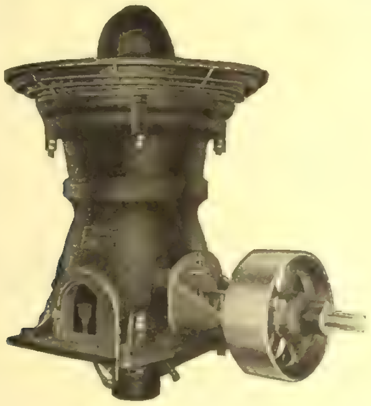

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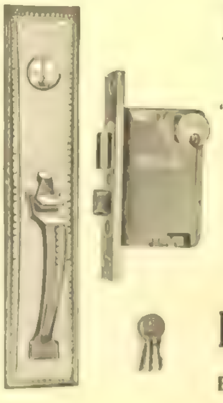

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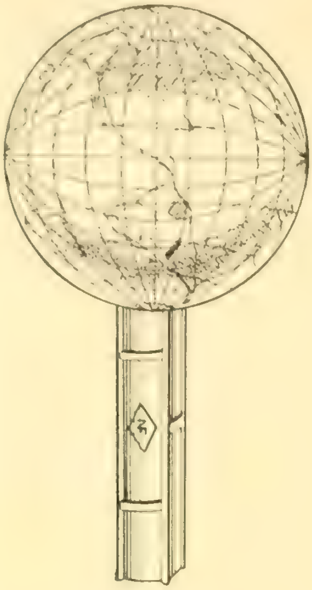

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Fort Erie, Ont.
On April 15th tenders will be received for $50,000 30-year waterworks debentures. B. F. Matthews, clerk.

Calgary, Alta.
Tenders are being called by this municipality until April 22nd for construction of sewers, water mains, etc. For further information see advertisement in this issue.

Hamilton, Ont.
Tenders are being called until April 9th for the construction of a cement sidewalk in the township of Barton. Specifications at office of J. Walter Gage, reeve, 34 Main street east. Alf. G. E. Bryant, township clerk.

London, Ont.
The estimates made by the Water Commisioners include: Service extension, $6,000; main extension, $10,000; metres and hydrants, $7,500.

Moose Jaw, Sask.
On April 11th a bylaw will be voted on to issue $140,000 20-year four and a half per cent. pavement debentures. W. F. Heal, city clerk.

Tenders addressed to W. F. Neal, city clerk, will be received until April 11th for trenching and laying 7,100 feet of sewer pipe. For further particulars see advertisement in this issue.

North Vancouver, B.C.
The Board of Works was empowered to proceed with street improvement work, pending the passing of the $25,000 bylaw for that purpose.

Ottawa, Ont.
City Engineer Ker submitted plans for the west end drainage system with a septic tank in Mechanicsville. The board approved and the plans will now be forwarded to the provincal board of health for approval.

Prescott, Ont.
This municipality will shortly invite tenders for the extension of their sewerage system, including one septic tank. A bylaw to raise $22,000 for this purpose has been carried.

Quebec, Que.
April 14th is the date set for the receiving of tenders for supply of annual supplies. Noted in last issue.

Regina, Sask.
The plans prepared and submitted by J. A. McPherson, of the sewerage system will be forwarded to Toronto for approval of T. Aird Murray, the Government consulting engineer.

Saskatoon, Sask.
Tenders addressed to J. H. Truesdale, city clerk, will be received until April 11 for all labor necessary for laying water mains and sewer pipes and furnishing certain materials therefore. Plans, etc., at office of George T. Clark, city engineer, this city. W. Hopkins, mayor.

Toronto, Ont.
The Ontario Railway Board has given the city permission to issue $45,000 debentures to cover the cost of laying trunk sewers in the east end annex.

Tenders addressed to G. R. Geary, chairman, Board of Control, will be received until April 5th for dredging slips, sewers, etc. Specifications at office of city engineer.

The city engineer has recommended that St. Clair avenue be widened from Avenue road to Bathurst street. Estimated cost, $170,000.

Vancouver, B.C.
The Board of Works are considering a new sewer bylaw. Many additional sewers are needed.

Victoria, B.C.
Council decided they would invite contractors to submit bulk tenders for sidewalk and paving work. G. H. Bryson, acting city engineer.

Winnipeg, Man.
Tenders were called for the supply of 137,000 pounds of lead pipe for the waterworks department to be in in three weeks.

AWARDED.

Ottawa, Ont.
The following tenders were received for annual supply of hydrants and valves for Waterworks Department: Thos. Lawson & Sons, Ottawa, $2,962.50; T. McAvity & Sons, St. John, N. B., $3,148.25; Canada Foundry Company, Limited, Toronto, $3,258.01; Kerr Engine Company, Walkerville, Ont., $3,657.00; Chaudiere Foundry Company, Ottawa, $4,515.80; Canadian Fairbanks Company, Montreal, irregular. The following gives the price of each article in tender of Thos. Lawson & Sons, Limited, the successful tenderer: Improved, 3 way hydrant as per s., $40.00; improved special hydrant with water crane attached, as per sample, $40.00; 4-inch stop valves, as per sample, $4.00; 5-inch stop valves, as per sample, $4.50; 6-inch stop valves, as per sample, $[illegible]; [illegible] stop valves, as per sample, $15.00; 12-inch stop valves, as per sample, $25.00; 15-inch stop valves, as per sample, $25.00; $24 inch stop valves, as per sample, 100.00.

The following is a list of tenders for supply of brass goods: James Robertson Company, Limited, Toronto, $1,672.10; McKinley & Northwood, Ottawa, $[illegible]; [illegible] Manufacturing Company, [illegible], Ont., $[illegible]; [illegible] & Company, Ottawa, $1,938.70. The list below gives the price of each article, as per sample, in the tender of James Robertson Company, Limited, of Toronto,, which was accepted: [illegible] inch brass stop cocks, $[illegible]; [illegible] inch brass stop cocks, $3.70; 1-inch brass stop cocks, $3.70; ½ inch brass couplings, 50 cents; ⅝ inch brass couplings, 63 cents; ¾ inch brass couplings, 85 cents; 1 inch brass couplings, $1.13; ½ inch off ⅝ inch Y branches $1.21; ¾ inch off ⅝ inch Y branches, $1.27; ⅝ inch taper nozzles, 50 cents; ½ inch taper nozzles, 34 cents; ¾ inch taper nozzles, 58 cents; 1 inch taper nozzles, 89 cents.

The following tendered for supply of oils and grease: Canadian Oils Company, Limited, Ottawa, $417.00; Queen City Oil Company, Limited, Ottawa, $423.73; also for lead pipe and pig lead: McKinley & Northwood, Ottawa, $1,527.60; J. Watterson & Company, Montreal, $1,582.25. The lowest was acepted in each case. The list below gives the price in regard to lead pipe and pig lead in the accepted tender: 3-8 inch lead pipe, weight per yard, 4 lb. $0.04; 1-2 inch lead pipe, weight per yard, 5 lb., $4.74; 5-8 inch lead pipe, weight per yard, 7 lb., $4.74; 3-4 inch lead pipe, weight per yard, 9 lb., $4.74; 1 inch lead pipe, weight per yard, 12 lb., $4.74; pig lead, best, $3.70.

The following tendered for annual supply of cast iron pipe: Alex. Freck, Limited, Ottawa, $8,901.63; Staveley Coal and Iron Company, Limited, Chesterfield, Eng., $8,726.77; John Coates & Company, Ottawa, $8,703.42; T. S. Kirby, & Company, Ottawa, 9,074.13. The council decided to accept the tender of John Coates & Company of Ottawa, for pipe made in England. Noted in last issue.

Prince Albert, Sask.
The tender of the American Sewer Pipe Company was accepted. The J. Morris Brass Manufacturing Company's tender for fittings was accepted.

Toronto, Ont.
The Board awarded the contract for one 42-inch hydraulically operated stop valve for the main pumping station to Canadian Fairbanks Company, Toronto, at $1,180.

Railroads, Bridges and Wharves

Cypress River, Man.
Tenders are being called until March 31 for the construction of station here, by the C. P. R. Plans, etc., at office of Division Engineer, Frank Lee, Winnipeg.

Calgary, Alta.
Tenders are being called until May 1st by the C. P. R. for all excavation required to complete the canal system in the eastern section of the company's irrigation block, Alberta, amounting to upwards of 25,000,000 cubic yards of material. Plans, etc., at office of assistant chief engineer, this city. J. S. Dennis, assistant to second vice president, C. P. R.

Fort William, Ont.
A bylaw has been passed to issue $[illegible] bridge debentures. A. McNaughton, city clerk.

Lindsay Ont.
Tenders are being called until April [illegible] for supply and erection of a [illegible] steel

bridge spans etc., over Little Bob river near the village of Bobcaygeon. For further information see advertisement in this issue.

Prince Albert, Sask.
Mayor Holmes is authority for the statement that the Hudson Bay Pacific would build from Prince Albert.

Regina, Sask.
The government of Saskatchewan will shortly call for tenders for the construction of the reinforced concrete abutments for a bridge near the town of Arcola, and tenders for two small reinforced concrete bridges near the towns of Estevan and Weyburn, in the Province of Saskatchewan. Tenders will also be called for the construction of reinforced concrete bridge abutments for some seven other bridges.

Sarnia, Ont.
Tenders addressed to Thos. T. Holmes, Colinville, Ont., will be received until April 6th for the erection of concrete abutments and concrete floor for a bridge over the Sydenham river. Plans at residence of the above.

Windsor, Ont.
It is understood that the members of the Dominion Railway Commission have expressed themselves as favorably disposed towards the proposed subway beneath the tracks of the Michigan Central Railway at the mouth of the tunnel.

Winnipeg Man.
Tenders are being called for the construction of concrete work necessary for the Fort Garry station viaduct.

The C. P. R., it is understood, have let contracts as follows: Foley, Welch & Stewart, a large part of the work in the west, and J. C. McArthur & Company, the bulk of the work near Winnipeg. In Alberta the Kipp extension will be built by Foley, Welch & Stewart. This line has been completed to the Little Bow river. Next year the line will be continued until a junction is affected with the Calgary-Macleod branch. The extension of the Langdon branch will also be built by the Foley, Welch & Stewart firm. The Weyburn extension will be built by the J. D. McArthur Company. Only twenty-five miles of the dump will be completed this year. The J. D. McArthur Company will also build the Outlook extension. The work of constructing this road from the Macklin end is a separate contract and the report is that Janse, McDonald & Timothy had been awarded the contract. The contract for the G. T. P. line from Regina toward Estevan and Portal has been awarded to the J. D. McArthur Company.

AWARDED.

Brandon, Man.
John Bradley, of this city, has been awarded the contract for building the C. P. R. line from Craven to Colonsey. The road will be 110 miles in length.

Prince Albert Sask.
Chief Engineer Atwood has announced that the Hudson Bay & Pacific Railway would be started this year and will be built by British capitalists headed by A. J. Spicer and it is believed the British government is interested in it as a military route to the Far West. A. J. Taylor of New York, has been awarded the contract.

Sydney, N.S.
The contract for the construction of branch of the I. C. R. from here to Orange River has been awarded to A. Kirk, Antigonish, N. S. It is estimated at $250,000.

Thornton, Ont.
At a meeting of the council of Essa, the contract for steel bridge with concrete floor over the Nottawasaga river was awarded to the Ontario Bridge Company for $2,900. G. C. Allan's tender for concrete abutments for bridge on No. 5 side road was accepted for $2,300. J. Coxworth, clerk.

Yorkton, Sask.
Peter Vergin has been awarded the contract for building 30 miles of the G.T.P. to Canora.

Public Buildings, Churches, Schools, etc.

Aberdeen, B.C.
Tenders are being called until April 11th for the erection and completion of a large one-room frame school building in the Chilliwack electoral district. Plans, etc., at offices of the Government agent, New Westminster and at the Department of Public Works, Victoria, B.C. F. C. Gamble, public works engineer.

Belleville, Ont.
The Board of Education of this city at a special meeting will ask the City Council to submit a bylaw to the ratepayers to borrow $50,000 for a new collegiate institute.

Brandon, Man.
The plan submitted by Thos. Sinclair, architect, has been accepted by the congregation of Knox Church for their new building on the corner fo Fifteenth street and Victoria avenue. Estimated expenditure, $25,000.

Chase, B.C.
Tenders are being called until April 12 for the erection and completion of a two-room frame school house here. Plans, etc., at office of Government agent, Kamloops, B.C., and at Public Works Department, Victoria. F. C. Gamble, public works engineer.

Duncan, B.C.
Tenders addressed to Messrs. Pott and Peterson this place, are being called for erection of brick building, concrete block finish, until April 4th. Plans, etc., at office of A. Maxwell Muir, C.E., 1208 Government street, Victoria, B.C.

Eyebrow, Sask.
Tenders addressed to W. J. Macdonald, this place, will be received until April 15th for the erection of a brick veneer church. Plans, etc., at office of the Macdonald Realty Company, this place.

Edmonton, Alta.
Tenders are invited for the erection of the Royal Alexandra Hospital, Edmonton, until April 1st. Plans and specifications at Winnipeg Builders' Exchange. Roland W. Lines, architect, Edmonton.

Headingly, Man.
Tenders addressed to C. W. Johnstone, secretary-treasurer, school board, will be received until March 31st for plans, etc., for a 2-room school house for District No. 9.

Hamilton, Ont.
It is possible that the registry office may not be built, the lowest tenders aggregating $50,000, while the bylaw called for the expenditure of $38,000.

The building committee of the First Methodist Church have reported favorably re the erection of a new church and will advertise for competitive plans for an edifice to cost about $35,000.

Tenders addressed to J. L. McLaren, chairman, Board of Control, will be received until March 31st for the several works required in the alterations and additions to the Nurses' Home at the City Hospital. Plans, etc., at office of the architects, Stewart & Witton, Hamilton.

Kildonan, Man.
A meeting of the ratepayers of East Kildonan school district will be called to select a new school site for a new school building to be erected in the East Kildonan school district.

Kipling, Sask.
Tenders are being called until April 15 for the erection and completion of a 4-roomed brick veneer school building here. Plans, etc., at office of John Sproat, secretary-treasurer, this place.

Lethbridge, Alta.
The Y. M. C. A. campaign brought $50,000. The committee will erect a $60,000 building. Noted in issue of March 9th.

London, Ont.
The council will be asked by the Board of Education to issue debentures for a new school to replace the Colborne street school. Noted in issue of January 19th.

Meaford, Ont.
Architect Forster, Owen Sound, has estimated the cost of remodelling the public school building at $8,000.

Moose Jaw, Sask.
The Curling Club are considering the erection of a new rink. President, Mr. F. Marlatt.

Montreal, Que.
The Catholic School Commission have decided to erect a modern 16-room school to cost $100,000. Competitive plans invited from local French-Canadian architects.

St. Agnes' Roman Catholic Church was damaged to the extent of $8,000 on the 27th inst.

Plans for the new Mount Royal Riding Academy, to be erected near the M. A. A. A., will be finally approved shortly. E. J. Sheppard, president of the Montreal Arena Company, president, and A. Gardner and Mr. Laurendeau, on the executive.

New Westminster, B.C.
The city will co-operate with various athletic clubs towards the construction of a new grand stand in Queen's Park, to seat about 3,000 people.

Ottawa, Ont.
The council has approved of the plans and estimates reported by Architect C. P. Meredith, Sparks Chambers, which call for an expenditure of $55,239 in the renovation of the City Hall and the installation of permanent fixtures. Tenders will be called shortly.

Negotiations are in progress for the erection of a theatre on Sparks street, probably to be controlled by the management of the Nickel theatre on Albert street.

The Board of Control are asking for tenders for the alterations and improvements to the City Hall estimated cost about $60,000.

Tenders addressed to N. Tessier, secretary, Department of Public Works, will be received until April 15th for restoration of and additional storey to Military Stores building. Plans, etc., at above Department.

J. A. Ewart, architect, will be asked to prepare specifications for calling for ten ders for the fittings required for the new registry office.

Prince Albert, Sask.
Word has been received here that an armory will be built next year at a cost of $10,000. The city will supply the site.

Peterborough, Ont.
Bids will be received until April 8th by E. M. Elliott, County Clerk, for installing a steam heating system to heat the court house and county buildings in this place.

Parkhill, Ont.
Tenders addressed to N. Tesier, secretary, Department of Public Works, Ottawa, Ont., will be received until April 12th for interior fittings, post office. Plans, etc., on application to Mr. Jas. Phelan, clerk of works, this place; Mr. T. A. Hastings, clerk of works, postal station "F," Toronto, and at the Department of Public Works, Ottawa.

Regina, Sask.
Plans and specifications for the erection of a new building for the Grey Nuns have been prepared by E. & W. S. Maxwell, architects, 6 Beaver Hall Square, Montreal, and are on view at their office.

St. Charles, Man.
On March 21st the ratepayers will vote on a bylaw to issue $40,000 school debentures, rural municipality of Assiniboia. F. Ness, Secretary-Treasurer, St. Charles, Man.

Toronto, Ont.
It is understood that the congregation of Central Presbyterian Church, corner of Grosvenor and St. Vincent streets, is seriously considering disposing of the present church property and securing a new site in the northern part of the city.

Tenders addressed to Arthur W. Holmes, architect, 10 Bloor street east, will be received until April 2nd for the brick and cut stone, terra cotta and reinforced concrete and carpenter's work required in the erection of a Community House for the Sisters of St. Joseph, at the House of Providence, Power street.

A committee, composed of W. E. Raney, Traders' Bank Building, A. S. Grant and others, will investigate as to the advisability of erecting an institutional church building for the Presbyterian denomination, and report at September meeting.

Tenders addressed to W. C. Wilkinson, secretary-treasurer, Board of Education, will be received until April 4th for the several trades required in the enlargement of Balmy Beach School. Plans, etc., at offices of City Hall.

Tenders addressed to G. R. Geary, chairman Board of Control, will be received until April 5th for the complete supply and installation of a low pressure steam heating system in St. Lawrence Hall. Plans, etc., at offices of the Property Department, City Hall, Ont.

The Y. M. C. A. have purchased property with frontage of 156 feet on the [illegible] corner of College and Dovercourt road. Estimated expenditure on building, [illegible]

Tenders addressed to J. P. Hynes, architect, 199 Yonge street, will be received until April 9th for an extension to the Church of Our Lady of Lourdes, Sherbourne street.

Tenders addressed to Darling & Pearson, 2 Leader Lane, will be received until April 3rd for the excavation of basement and foundations of the main building, Toronto General Hospital, College street. Plans, etc., at office of the above.

Vancouver, B.C.
Plans for a palmhouse and conservatory to be erected in Stanley Park are being considered by the committee in charge of the Oppenheimer memorial. The plan submitted by A. Campbell Hope, 336 Hastings street, calls for one large building with two wings.

Mr. J. F. Harley, representative of the Shuberts and Liebler Consolidated Attraction Company, New York, has been here looking for a suitable site for a theatre.

Winnipeg, Man.
The Thistle Curling Club and the members of the Builders' Exchange have decided to build a large curling plant upon which work will start in the summer.

Dr. Sharpe has submitted plans for the various hospital buildings. The bylaw to raise $600,000 for hospital will be submitted to the ratepayers. Hospital committee, G. V. Hastings, D. E. Sprague and A. Strang.

The governors of the university decided in favor of F. W. Heubach's offer of Tuxedo Park as a site for the proposed university buildings. Noted in issue of February 23rd.

The St. Charles Country Club was destroyed by fire on the 24th inst. Loss $50,000.

AWARDED.

Annapolis Royal, N.S.
The contract for the building of the new Roman Catholic church has been secured by Mr. Allen, of Middleton, and work will shortly be commenced.

Barrie, Ont.
The following tenders for heating gaol were received. The lowest received the contract: Phillips & Company, Orillia, $1,451; J. Neelands, Barrie, $1,419; Orillia Hardware Company, Orillia, $1,908; Armstrong Bros., Midland, $2,070; Landon & Flesher, Barrie, $1,720; J. R. Hambly, Barrie, $1,548; Purdy & Mansel, Toronto, $1,964.

Berlin, Ont.
Following contracts for the new market building were recently awarded: Mason work, Steckenreiter and Koenig, $3,830; carpenter work, Ovens & Jacobi, $2,212; plumbing, [illegible]. Weichel & Son, $329; painting, C. Wolfe, $145.

Clayoquot, B.C.
Mr. Maltby has been appointed the contractor by the government for building the new district school house. Work will begin at once.

Hull, Que.
The contract for the building of the new St. Jean Baptiste School has been awarded to Louis Lemieux at $5,400. A. Archambault will supply the fittings for $1,500. Work will be commenced at once.

Hamilton, Ont.
Adam Clarke & Son have been awarded the contract for plumbing at the new lavatory, House of Refuge, $461.

Montreal, Que.
General contract for the erection of a Roman Catholic presbytery at La Prairie, Que., has been awarded to Francis Dufresne, general contractor, St. Laurent, Que. The building will be of pressed brick construction, with concrete foundation. G. A. Monette, 97 St. James street, architect.

Ottawa, Ont.
M. M. [illegible], [illegible] Bank street, has been awarded the contract for plumbing, heating and ventilating of the new golf club, on the Aylmer road.

Portage la Prairie, Man.
The contract for the alterations and additions to the hospital here has been awarded to Bedman & Oborne, $947.

Prince Rupert, B.C.
The contract for the new school house has been awarded to A. J. Prudholme.

Strathcona, Alta.
Contractor Grant, of Edmonton, has the contract for the building of the Methodist College; excavation contract, Radford & Smith, of this city. Architect, Mr. Magoon, of Edmonton.

Yorkton, Sask.
S. Brown, of Winnipeg, Man., has been awarded the contract for erecting the new collegiate institute, $56,860.

Residences

Cobourg, Ont.
Tenders addressed to Power & Son, architects, Kingston, will be received until April 4th for the erection and completion of a residence for G. M. Roger Esq., county judge. Plans, etc., at office of Col. N. F. MacNachton, county clerk, Cobourg.

Chatham, Ont.
Tenders will be received by Jas L. Wilson & Son, architects, until April 2nd, for all trades in the erection of a concrete, brick and frame residence for Mr. Joseph Neff. The drawings, specifications, etc., can be seen at office of the former.

Edmonton, Alta.
On Saskatchewan avenue Mr. G. W. Marriott will erect a fine brick residence. Cost, $4,500.

Mr. Hugh Duncan intends to build a brick residence on Main street north at a cost of $4,000.

Montreal, Que.
Tenders are being received this week for the erection of a residence on Ontario avenue for Mr. J. M. Wilson. Saxe & Archibald, architects, 59 Beaver Hall Hill.

Joseph Perrault, architect, 2106 Park avenue, has prepared plans for a residence to be erected for Mr. H. Pelletier, at the corner of Boulevard St. Joseph and St. Urbain street.

Toronto, Ont.
Humber Heights, residence owned by National Trust Company, was destroyed by fire on the 25th inst. Estimated loss $4,500.

Mr. Alexander Park has a permit for a three storey brick apartment house at the southeast corner of Winchester and Metcalfe streets. Cost $26,000.

Walkerville, Ont.
Donaldson & Meier, Penobscot Building, Detroit, Mich., are preparing plans and specifications for a new residence for T. W. McGregor, 239 Brush street, above here, on Lake St. Clair.

Winnipeg, Man.
William [illegible] apartment house to be erected this spring [illegible] to be erected on Ruby street. Angus Brown [illegible] in Norwood.

Tenders addressed to George H. Teeter, [illegible] received until April 1st for the erection [illegible]

AWARDED.

Montreal, Que.

The contract for alterations to the property at [illegible] University street, for Eadie Douglas, Limited, has been awarded to T. Ward, general contractor. Saxe & Archibald, 59 Beaver Hall Hill, architects.

Strathcona, Alta.

Ald. Congdon has the contract for the residence to be erected near the university grounds, for Mr. W. R. Pearce, at a cost of $4,500, architects, Wilson & Herrald; also a bungalow for Dr. Broadus.

Business Buildings and Industrial Plants

Belleville, Ont.

It is said to be definitely settled that the C. N. R. station will be on what is known as the old Cricket field, near Bay front, just north of the rolling mills. The station and yard will cover four acres.

Berlin, Ont.

J. Kaufman will erect an addition to his planing mill, 40 by 100 feet, four storeys, of reinforced concrete. Estimated cost about $14,000.

Brandon, Man.

The citizens feel that a new fire hall is needed and steps may be taken to erect one. H. Brown, clerk.

Arangements are under way for the establishment of a distributing warehouse for the B. F. Nelson Manufacturing Company, of Minneapolis, Minn., makers of high grade roofing and building paper. This is thought to be the first step towards the erection of a plant here. Mr. Harwood, secretary, board of trade. F. P. Barker, Canadian business manager.

Chatham, Ont.

Tenders addressed to J. L. Wilson & Son, architects, will be received until March 31st for all trades in the erection of a concrete, brick and frame addition and renovations, also an office building for the Dowsley Spring & Axle Company.

The Royal Bank of Canada has been for some time anxious to establish a branch here, and has been negotiating for a site opposite the post office.

Calgary, Alta.

The G. T. P. are said to have secured options on sites suitable for a union depot here.

Senator Lougheed will erect a skyscraper, on Seventh avenue at a cost of $300,000, to be completed within the year.

Craik, Sask.

Tenders addressed to E. A. Phillips, secretary-treasurer Farmers' Elevator and Trading Company, will be received until April 2nd for the building of a 60,000-bushel elevator, with up-to-date equipment.

Campbellville, Ont.

The C. P. R. station was destroyed by fire on the 26th inst.

Eburne, B.C.

The ratepayers' association will build a $60,000 hotel. Messrs. Wells, W. F. Stewart, Hutchison, Marsden and Dixon are on the building committee.

Fort William, Ont.

The Canadian Bank of Commerce have purchased fifty feet on Victoria avenue. Expenditure for site and building, over $100,000. No definite announcement has been made in regard to plans. A. A. Wilson, local manager.

The International Harvester Company will build a four storey warehouse, 500 by 90 feet, of concrete and brick, to cost about $250,000, for which a site has been secured on C. P. R. property. J. G. Uffendel ,local representative.

Gilbert Plains, Man.

The Canadian Elevator Company's elevator was destroyed by fire on the 24th inst.

Hamilton, Ont.

The instalation of a steel rod mill in connection with the Hamilton Steel & Iron Company's plant is now practically assured. President, Wilcox.

Kingston, Ont.

The bylaw to exempt the Government dry dock from taxation after the lease to the Kingston Shipbuilding Company was carried. It is the intention of the company to start the establishment of a $50,000 plant, to be ready for the opening of navigation. The company will eventually establish a complete shipbuilding plant.

Medicine Hat, Alta.

Six large American industries will, within the next thirty days, establish branches or remove their entire plants here. The industries include a 3,000 barrel flour mill and elevator, a sash and door factory, a general machine shop, a foundry, a sawmill, a machinery manufacturing company and a farm implement manufacturing firm.

Moose Jaw, Sask.

The Macleod-Hamelin Company have plans out for a 25-foot addition to the rear of their present store premises. Pending the erection of a large department building this will afford temporary relief.

Montreal Que.

The United Shoe Manufacturing Company of Canada have purchased ten acres of land at the Park avenue extension adjoining the C. P. R. tracks, and will erect an extensive factory building. Mr. H. C. Stone, architect, 80 St. Francois Xavier street, is preparing the plans.

Robt. Findlay architect, 10 Phillips Place, is calling for tenders up to the 1st of April, 1910, for the painting and glazing of the Anglo-Canadian Leather Company's property on Notre Dame street west.

It is expected that a definite announcement will soon be made regarding the construction of an addition to the new Wilder building, completed last fall.

North Toronto, Ont.

Davis Bros.' stores, 73-75 Yonge street, were damaged by fire on the 23rd inst. Estimated damage, $5,000.

Nelson, B.C.

The Rossland Engineering Works will be moved to Nelson on April 1st and amalgamated with the Nelson Iron Works, to be known as the Consolidated Engineering Works of Nelson, Limited. W. M. Cunliffe of the Rossland company joins B. A. Isaacs and R. W. Hinton of the local company and the works here will be considerably enlarged.

Owen Sound, Ont.

Tenders are being called until March 31 by Corbet Foundry & Machine Company, for the different trades and material required for the erection of a foundry and machine shop.

Oshawa, Ont.

The Malleable Iron Works Company will shortly begin another extension, 40 by 40 feet, to their plant.

Ottawa, Ont.

C. J. Burritt, architect, is calling for tenders for extensive alterations to the Slater block, 201 Sparks street, to be occupied by the Willis Piano Company.

Weeks & Keefer, architects, 229 Sparks street, were the successful competitors among the six who submitted plans for the six-storey business block to be erected for Messrs. Rosenthal & Sons, on Sparks street.

Messrs. Cowie, Kemp and Edey have sold the southwest corner of Bank and James street, on which, it is stated, stores will be erected. Nimmo & Soper effected the sale.

Port Arthur, Ont.

Hon. Mr. Pugsley made the statement in the House of Commons that the G. T. P. would erect a 10,000,000 bushel elevator here.

Prince Albert, Sask.

The Northern Produce Company have secured a site of ten acres on Miller's Hill on which will be erected a $50,000 abattoir shortly. Plans of the building have to be submitted for the approval of the council before April 4th. Dr. J. A. Moran is interested.

Portage la Prairie, Man.

Plans are being prepared for the Urban Mutual Assurance Company for their new brick building. Work will not begin until the latter part of May. Noted in issue of March 16th.

Prince Rupert, B.C.

The Bank of B. N. A. will erect a building on the corner of Third avenue and Fulton street. H. E. Wallace, formerly of Rossland, will erect departmental stores on the corner of Fulton and Third avenue. O. M. Helgerson is erecting a building on the corner of Sixth street and Second avenue.

Stewart, B.C.

Finch & Finch will establish a department store here.

Saskatoon, Sask.

Tenders addressed to the Saskatchewan Milling & Elevator Company, Limited, this place, will be received until April 1st for the erection of 1,000 barrel brick mill building ,frame flour house and concrete storage tanks. Plans etc., at office of the company, 517 Grain Exchange, Winnipeg, Man.

Truro, N.S.

Construction will probably start in the second week of April on the new Foundry & Machine Company's building. Charles Hill and Davidson Hill are interested in the promotion of a wood-working factory.

Toronto, Ont.

Messrs. Gourlay, Winter & Leeming intend to erect a four storey and basement piano factory on Logan avenue, to cost $50,000. Plans filed with the city architect. The building will be of mill construction.

Wickson & Gregg, architects, 59 Yonge street, are preparing plans for the erection of a warehouse for John Wanless & Company.

Vancouver, B.C.

An eight storey reinforced concrete block will be built on the north side of Pender street. Inkster & Ward, 421 Richards street, effected the sale.

Plans have been presented to Building Inspector Jarrett for extensive alterations to the Hotel Rainier.

The following motion was adopted by the Board of Trade: "That the municipal council be asked to place in their first money bylaws a sum of $300,000 for the purpose of purchasing the water frontage on the Fraser river for industrial purposes.''

W. T. Whiteway, architect, Molson's Bank Building, has designed the plans for the 10-storey steel block near Carrall street, to be erected for William Holden. Estimated cost of structure, $250,000.

Victoria, B.C.

Anxious to establish a soap manufactory on the Pacific coast the W. & L. Bailey Company of Colborne, Ont., has written to Mayor Morley as to the prospects for locating here

Plans are being prepared by G. C. Mesher Company for a concrete and brick three storey block for Finch & Finch, 1107 Government street. Estimated cost, $20,000. Tenders will be called as soon as the plans have been approved.

Windsor, Ont.

The Dominion Railway Commission have inspected the location for the proposed new station for the Michigan Central Railway at the mouth of the tunnel and have approved.

The block occupied by D. M. Ferry & Company, and owned by the Molsons Bank was destroyed by fire on the 25th inst.

Winnipeg, Man.

Property with frontage of 132 feet on Marion street, 110 feet on St. Mary's road, 230 feet on Smith street and 100 feet on Lillian, has been sold through F. W. Heubach & Company. It is expected that arrangements for the erection of an apartment block with stores on ground floor will be started shortly.

Tenders will be received by Douglas & Company, 86 Princess street, for a brick and stone warehouse on Adelaide street, also tenders for excavation. Plans and specifications at office of above.

Excavations commence this week for a three storey business building being erected on the corner of Notre Dame and Princess streets. Estimated expenditure, $150,000; materials, concrete, brick and stone.

The Bank of Commerce announce that they will practically tear down their present building and double its size, taking in adjoining property at a cost of $600,000.

AWARDED.

Brantford, Ont.

The Brantford Cordage Company, of West Brantford, have decided to enlarge their premses, contract for which has been let to Schultz Bros., who will start work at once.

Fort William, Ont.

The contract for the erection of annex to Victoria Hotel has been awarded to Seaman & Penniman, $30,000.

Hamilton, Ont.

The following contracts in connection with the steel building to be erected for the Sawyer Massey Company were awarded: Hamilton Bridge Works, structural steel; George E. Mills, mason work; Thos. Irwin & Son, roofing.

Montreal, Que.

The J. F. Jago & Company have been awarded the contract for the reinforced concrete work in connection with the construction on the Guaranteed Milk Company's new building.

The contract for the stone, brick and wood work on a four storey building to be erected on St. Lawrence Boulevard, has been awarded to Paquet & Godbout. The other contracts have not yet been awarded. Eugene Payette architect, 15 St. James street.

Ottawa, Ont.

Architect Albert Ewart has awarded a contract to Messrs. J. & C. Low, for alterations to the Arcade building, Sparks street.

Toronto, Ont.

The contract for the galvanized iron work, windows, roofing and ceilings for the Gideon Miller Building has been awarded to A. B. Ormsby, Limited, Toronto.

Vancouver B.C.

The contract for the superstructure for the Canada Life Building has been awarded to McDonald & Wilson of this city. Estimated cost, $200,000. A. A. Cox, architect, Montreal and Vancouver.

Power Plants, Electricity and Telephones

Brandon, Man.

The Brandon Electric Light Company has applied to the city council for power to instal in the city of Brandon a system to supply heat for public use.

Coaticook, Que.

The bylaw to borrow $122,000 for the purpose of improving the light plant, and other purposes, was carried.

Fort Frances, Ont.

A bylaw will be submitted to the ratepayers on the 8th of April for the purpose of providing $10,000 for the construction of a municipal electric lighting system.

Kamloops, B.C.

This municipality agrees to take power from the Shuswap Power Company in accordance with Engineer Dutcher's recommendation. When the matter is finally settled, the company will spend, it is estimated, about a million dollars.

Moose Jaw, Sask.

The city council decided, subject to the conditions being acceptable to the proposers, to make the draft franchise for a street railway received from Ottawa form the basis of a bylaw to be submitted as soon as possible. At present it provides that three miles of railway are to be constructed this year, a similar amount next year, the city to control the line of route and time schedule.

Montreal, Que.

Tenders addressed to E. A .Robert, managing director, Canadian Light & Power Company, will be received until April 9th for rock and earth excavation in the Beauharnois canal, between Valleyfield and St. Timothee; also for intake works at Valleyfield, including coffer dam, and culverts in the canal. Plans, etc., at office of above.

North Gower, Ont.

A new telephone system to cover North Gower and Marlborough will be established with central office at North Gower. Capital, $30,000. President, H. G. Blair, and J. A. Craig, secretary-treasurer.

Prince Rupert, B.C.

Tenders are being called for electric light installation for boilers, engines and dynamos, pumps and piping, together with electrical apparatus, until May 3rd. Plans, etc., obtained from [illegible], chairman of committee, this city, or from [illegible] Milne, consulting engineer, Loo Building.

Regina, Sask.

At a special meeting of the city council it was decided, subject to the ratification of the ratepayers, that a street railway franchise be granted to J. W. DeC. O'Grady, J. A. Anderson and J. Geddes, of Winnipeg. The contract provides that seven miles of track shall be laid by December, 1910.

Sherbrooke, Que.

The bylaw granting a 28-year's franchise to Sherbrooke Railway Company was carried. The company promise to spend $50,000 in extensions and developments to power plant. C. B. Hibbard, Montreal, representative of company.

Stirling, Ont.

The ratepayers voted in favor of the bylaw to issue electric light debentures for $10,000.

Winnipeg, Man.

A recommendation from the city electrician that the Board of Control be instructed to call for tenders for 100 luminous arc lamps, 6.6 amperes, for street lighting, was adopted by the fire, water and light committee recently. Estimated cost, $17,000.

Tenders were received by the Board of Control for fencing the power transmission right of way. These were all considered too high, and new tenders will be called.

W. G. Chace, engineer, will call for tenders at once for the following works:—The erection of the power sub-station on McPhillips street, estimated to cost $10,000; the equipment of the sub-station, estimated cost 3$7,000; a conduit from the terminal station, along Higgins avenue, to the sub-station, estimated cost $48,000, and a 20-duct conduit on the west side of Main street, from the C. P. R. subway to Portage avenue, estimated cost $21,000. The work is to be proceeded with as soon as possible. Tenders on cables and wire for the power distribution will be called in the near future.

AWARDED.

Hull, Que.

Contract for the construction of an addition to the city power house was awarded to E. R. Bisson, of Hull, at $13,386.40. Other tenders were: Carrier & Wilson, Hull, Que., $17,527; Noel & Ouillette, Hull, Que., $15,800.

Ottawa, Ont.

The Municipal Electric Commission has awarded the following contracts for supplies: Transformers, Canadian General Electric Company, $795.00; meters, Ferrante, Limited, $632.00; lathe, General Supply Company, $198.60; hardware, Thos. Birkett & Son Company, 144.93; arc lamp carbons, Engineering Equipment & Supply Company, $741.71; Insulators, Canadian General Electric Company, $66.00; arc lamp globes, Garrioch, Godard & Company, $139.12; locust toppins, Canadian General Electric Company, $37.00; tape, Canadian General Electric Company, $88.00; large split knobs, Canadian General Electric Company, 9.00; porcelain insulator knobs, Canadian General Electric Company, $15.00; portable meters, [illegible] & Company, Limited, $124.90; motor, Garrioch, Godard & Company, $141.00; switch board panels and regulators, Canadian General Electric Company, 1,000.00.

Garrioch, Godard & Company have been awarded the contract for Sunbeam lamps at [illegible]. The Sunbeam Incandescent Lamp Company also tendered at the same price. For wire the lowest tenderers were Garrioch, Godard & Company, and the Canadian General Electric Company each for [illegible]. The contract has been divided between Garrioch, Godard & Company

(Continued on page 30)

Tenders and For Sale Department

Tenders for
Pipe and Water Connections

Sealed tenders will be received by the City Clerk, Brandon, Man., until 12 o'clock at noon on FRIDAY, THE FIRST DAY OF APRIL NEXT, for the supplying of

About from 100 to 200 tons of Cast Iron Pipe and Specials.

About [illegible] feet each of 10 inch and 12 inch Sewer Pipe.

Also brass goods for water connections etc.

All tenders to be f.o.b. Brandon, Man.

The lowest or any tender not necessarily accepted.

Further particulars and specifications can be obtained at the City Engineer's office.

R. E. SPEAKMAN,
City Engineer,
Brandon, Man.

13

Supply of Steel Pipe

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on APRIL 5TH, 1910, for the supply of one thousand feet of rivetted steel pipe, seventy-two inches in diameter, and also twenty flexible joints.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications may be seen and forms of tender obtained at the office of the City Engineer, Toronto, and at the office of the Canadian Engineer, at B33, Board of Trade Building, Montreal.

The usual conditions relating to tendering as prescribed by City By-Law, must be strictly complied with, or the tenders will not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY, (Mayor),
Chairman, Board of Control.

City Hall, Toronto, March 18th, 1910. 13

Town of Weyburn
Province of Saskatchewan

WATER WORKS AND SEWERAGE WORKS

Sealed tenders will be received by the Secretary-Treasurer of the Town of Weyburn, until 8 p.m. on WEDNESDAY, APRIL 27TH, 1910, for the following works:—

Contract "A"—Pipelaying on the Sewerage System.
Contract "B1"—Water Works Pump House.
Contract "B2"—Power House.
Contract "F"—Mechanical Water Filters.
Contract "G"—Water Works Pumping Machinery.
Contract "S"—Sewer Pipes.
Contract "W"—Furnishing Wooden Stave Pipes.
Contract "X"—Sewage Disposal Works.

Plans and specifications may be seen at the office of the Chief Engineer Toronto and Winnipeg, and at the Town Hall, Weyburn.

R. H. SMITH Esq., M.D.
Mayor,
Weyburn, Sask.

GEO. ROSS, Esq.,
Secretary-Treasurer,
Weyburn, Sask.

WILLIS CHIPMAN C.E.,
Chief Engineer,
Winnipeg and Toronto.

13

Plant for Sale

For Sale:—The following Second-Hand Plant, located at Durham, Ont., or portion theerof. The whole lot at a reduced price,

25 No. 3 American, square pan, wooden hub, Wheel Scrapers.
28 No. 3 K. & J., round pan, iron hub, Wheel Scrapers.
6 No. 3 Western, square pan, with doors, Wheel Scrapers.
7 No. 2, K &J, round pan, iron hub improved, Wheel Scrapers.
55 Doors and Gates, for No. 3 Wheel Scrapers.
27 Slush Scrapers.
15 Light and Heavy Plows.

Located at Three Rivers, Que.

One Large Travelling Clam Shell Derrick.
One Steam Pile Hammer (Cram Patent), with Steam Hose.
One Thomas Automobile (Model 31), 60 h.p., thoroughly overhauled and painted; location, Toronto.

THE RANDOLPH MACDONALD CO., LIMITED,
14 Crown Life Building, Toronto, Ont.

Town of Weston
Province of Ontario

Water Works

Sealed tenders will be received by the Village Clerk until 8 p.m. on MONDAY, APRIL 18TH, 1910, for the following works:—

Contract "B"—Pump House.

Contract "F"—Mechanical Water Filters.

Contract "G"—Electrically Operated Pumping Machinery.

Plans and specifications may be seen at the office of the Chief Engineer, Mail Building, Toronto, or at the Town Hall, Weston.

R. J. BULL, Esq.,
Mayor
Weston, Ont.

J. H. TAYLOR, Esq.
Clerk,
Weston, Ont.

WILLIS CHIPMAN Chief Engineer,
13 204 Mail Building, Toronto, Ont.

Town of North Battleford
Province of Saskatchewan

WATER WORKS AND SEWERAGE WORKS

Sealed tenders will be received by the Secretary-Treasurer of the Town of North Battleford until 8 p.m. on TUESDAY, APRIL 19TH, 1910, for the following works:—

Contract "A"—Pipelaying, Waterworks, and Sewers .
Contract "D"—Cast Iron Water Pipes.
Contract "E"—Fire Hydrants, Vales, etc.
Contract "L"—Concrete Reservoir.
Contract "X"—Sewage Disposal Works.

Plans and specifications may be seen at the office of the Chief Engineer, Winnipeg and Toronto and at the Town Hall, North Battleford.

J. A. FOLEY, Esq.,
Mayor,
North Battleford, Sask.

S. COOKSON,
Secretary-Treasurer,
North Battleford, Sask.

WILLIS CHIPMAN, C.E.,
Chief Engineer,
Winnipeg and Toronto.

13

TENDERS

Sealed tenders addressed to either of the undersigned and marked "Tender" will be received until noon on WEDNESDAY, APRIL 6TH, 1910, for the building of Concrete Abutments and Floor for a Steel Bridge to be erected over the Sydenham River between the Townships of Moore and Sombra.

Plans and specifications can be seen at the office of the undersigned, and also at the office of Bell & McCubbin, Civil Engineers, St. Thomas. A marked cheque for $200.00 must accompany each tender.

T. H. HOLMES,
Colinville, Ont.

NEIL McGUGAN,
Wilkesport Ont.

March 18th, 1910. 13

Temiskaming and Northern Ontario Railway Commission

Sealed tenders addressed to the undersigne will be received up to 12 o'clock noon, on WE NESDAY, APRIL 6TH, for the following:—

(A) All the works required in connection wi construction of abutments to bridge at M. 48.91. Tenders to be marked on the envelop "Tender for Abutments."

(B) All the works required in connection wi construction of substructure of steel trestle f Wabis River, M. P. 119.13. Tenders to be mark on envelope, "Tender for Substructure of Ste Trestle Spans."

Plans and specifications may be seen, a forms of tender procured, at the office of t Secretary-Treasurer, 25 Toronto Street, Toron and at the office of the Chief Engineer, Nor Bay.

Certified cheque on a chartered bank of Cana for the sum of $200.00, must accompany tend A and B, and the successful tenderer must a enter into an agreement satisfactory to the Co mission for the due execution of the said wor and to furnish additional security for the d performance of contract in the sum of $400. in each case.

The lowest or any tender not necessarily cepted.

A. J. McGEE, Secretary-Treasurer,
25 Toronto Street, Toror

Toronto, March 17th, 1910.

Papers inserting this adertisement with authority, will not be paid for same.

Positions Wanted

CONCRETE WORK.—A good man, well u the business, thoroughly understands plans, h ling men and getting results, and a hustler open for a change, or would take contract, town. Box 949, Contract Record, Toronto.

Miscellaneous

WANTED TO FORM PARTNERSHIP wi practical contractor, or one who wishes to large and needs more financial assistance. A Box 952 Contract Record, Toronto.

The City of Calgary

Tenders will be received by the City Commissioners up to and including APRIL 22ND, 1910, at 4 o'clock p.m., for supplying the City of Calgary with the following material:

Salt Glazed, Vitrified Clay Sewer Pipe, according to specifications to be furnished by the City Engineer. Tender to state price, f.o.b. Calgary.

A marked cheque for $100 to accompany each tender.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary March 17th, 1910. 16

Tenders

Toronto General Hospital

Tenders will be received by the undersigned up till noon, the 3RD APRIL next, for the excavation of Basement and Foundations of the Main Building, Toronto General Hospital, College street.

Plans and specifications may be seen at the office of the architects.

The lowest or any tender not necessarily accepted.

DARLING & PEARSON,
2 Leader Lane.

Toronto Board of Education

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board will be received until MONDAY NOON, APRIL 4TH, 1910, for the several trades required in the enlargement of Balmy Beach School.

Plans and specifications may be seen and all information obtained at the offices of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in the said specifications and forms of tender, The lowest or any tender will not necessarily be accepted.

W. H. SMITH, W. C. WILKINSON,
Chairman of Committee. Sec.-Treas.
13

Tenders for

Pipe Laying, etc.

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to TUESDAY, APRIL 5TH, 1910, for the supply of 16-inch special castings, kerbcocks, and pipe-laying for the season of 1910.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specfications may be seen and forms of tender obtained at the office of the City Engineer, Toronto.

The usual conditions relating to tendering, as prescribed by city by-law, must be strictly complied with, or the tenders will not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor)
Chairman Board of Control.

City Hall, Toronto, March 22, 1910.

County of Victoria

Tenders for

Steel Bridge Spans

Tenders, so marked, will be received by the undersigned until WEDNESDAY, APRIL 13TH, 1910, for the supply and erection of two (2) Steel Bridge Spans of sixty (60) feet each over all for a bridge in two parts separated by a fill of about 100 feet, across Little Bob River, near the Village of Bobcaygeon.

The spans are to be of sufficient width to provide a clear fourteen (14) feet roadway, unobstructed, to be constructed for the reception of a concrete floor and in all respects to conform to the Ontario Government specifications, 1909.

The tenders are to include the supply of wire bonding for the concrete floor, of corrugated steel and of approved strength.

Tenderers are to furnish with their tenders plans of the spans, with all requisite details, and certified by the Department of Public Works of Ontario.

Further particulars on application.

No tender necessarily accepted.

J. R. McNEILLIE,
County Clerk.

Lindsay, March 26th, 1910. 14

TOWN OF DUNNVILLE

Provinoe of Ontario

Notice to Contractors

Sealed tenders will be received by the Town Clerk until 8 p.m. on TUESDAY, APRIL 19TH, 1910, for the following works:

(a) For constructing Sewage Pumping Station.

(b) 3,000 feet of wrought iron pipe, and brass valves.

(c) Laying of the above for Compressed Air Line,

(d) Air Compressors.

(e) 400 manhole steps.

No tender necessarily accepted.

ROBT. BENNET, ESQ., Mayor, Dunnville, Ont.

J. W. HOLMES, ESQ., Town Clerk, Dunnville, Ont.

WILLIS CHIPMAN,
Chief Engineer, Toronto, Ont.

Tenders for

Steam Heating System

Tenders addressed to the undersigned will be received by registered post only, up to 12 o'clock noon on TUESDAY, APRIL 5TH, 1910, for the complete supply and installation of a low pressure steam heating system in St. Lawrence Hall.

Copy of specifications may be seen and tender form obtained, together with all information relative thereto, at the offices of the Property Department, City Hall, Toronto.

The usual conditions pertaining to tendering, as prescribed by city by-law, must be strictly complied with, and envelopes containing tenders must be plainly marked on the outside as to contents.

The lowest or any tender not necessarily accepted.

G. R. GEARY, (Mayor)
Chairman Board of Control.

City Hall, Toronto, March 21st, 1910

Township of East Zorra

Tenders Wanted

Tenders will be received by the undersigned up to 3 o'clock p.m., of MONDAY, APRIL 11TH, 1910, for the erection of a Steel Bridge and Concrete Abutments therefor, in the Township of East Zorra, Oxford County, Ont., bridge to be 70 feet long over all and 14 feet clear width, with concrete reinforced floor, and guaranteed to carry a moving load of 15 tons. Tenderers to furnish plan and short specification of proposed work and may offer for the whole work, or for erected bridge, or for abutments, or for floor only. For further particulars apply to

JAMES ANDERSON,
Clerk, East Zorra,
Hickson P.O., Ont.
14

Tender

City of Moose Jaw, Sask.

Sewer Construction

Sealed tenders addressed to the undersigned and endorsed "Tender for Sewer Construction," will be received unti 8.30 p.m. on MONDAY, APRIL 11TH, 1910, for Trenching and Laying 7,100 Lineal Feet of 10 inch and 12 inch Sewer Pipe.

Plans and specifications may be seen at the office of Angus Smith, City Engineer. The lowest or any tender not necessarily accepted.

W. F. HEAL,
City Clerk.

Moose Jaw, Sask., March 19th, 1910. 13

The City of Calgary

Tenders will be received by the Commissioners of the City of Calgary up to and including the 22ND DAY OF APRIL, 1910, at 4 o'clock p.m., for the construction of the following works, according to plans and specifications to be furnished by the City Engineer:

Five miles of sewer, inculding pipe,

Three miles of water mains, city supplying pipe.

A marked cheque for $500 to accompany each tender.

A bond of maintenance for one year signed by a satisfactory surety company to be delivered when work is completed.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary, 17th March, 1910. 16

Business Notes

Rodier & Drolet, electricians, Montreal, Que., have dissolved.

Hotte Fossey & Company, contractors, Montreal, Que., have dissolved.

Tobermory Lumber Company, Tobermory, Ont., is stated to have assigned.

Dalmer & Bennett, contractors, Winnipeg, Man., are stated to have dissolved.

Corey & Campbell, Bedford, Que., sash and door manufacturers, have dissolved.

A. King & Company, contractors, Montreal, Que., A. King & D. Williams, registered.

Thomas MacKenzie & Company, [illegible] merchants, Montreal, Que., have dissolved partnership.

Martin & Tremblay, plumbers, Montreal, Que., Joseph A. Martin and Arthur Tremblay, have registered.

Power Plants, Electricity and Telephones

(Continued from page 27)

and the Canadian Genaral Electric Company, one half to each.

St. Thomas, Ont.

The power committee awarded the contract for general supplies to Ingram & Pevey at $1,561.44. James Gardiner, Jr., Company, of Bolivar, Penn., received the contract for a new gas bench at $495. The tender of Parker, Russell Company, of St. Louis, was for $624. The Gartshore Foundry Company, of Hamilton, and the Canada Foundry Company, of Toronto, offered to furnish 30,000 tons of cast iron pipe at $34 and $34.50 per ton respectively. The former company secured the contract.

Miscellaneous

Kelowna, Man.

On March 30th the ratepayers will vote upon bylaws to borrow $30,400 for the rebuilding of the power house, destroyed by fire last June and $10,000 for an extension of the waterworks system.

London, Ont.

The cement contract was awarded to W. Heaman & Son for $1.59 a barrel. The next lowest tender was $1.75.

Montreal, Que

Recent building permits include: Alph. Masse, 424 Cuvillier street, house containing two dwellings, $2,000; Jos. Jeannette, 62 St. Edward, house containing three dwellings, $3,000; J. L. Rinfret & Company, 834 Papineau avenue, house containing five dwellings, $4,000; Henri Pelodeau, 2238 Park avenue, two houses containing six dwellings, $12,000; A. Cadieux, 1277 St. Dominique street, three houses containing nine dwellings, $8,000; M. Larese & Company, 1169 Simard street, house containing three dwellings, $4,000; George S. Gordon, 574 Clark street, house containing three dwellings, $4,500; J. A. Jarry, 817 Boulevard St. Joseph, two apartments containing thirty-two dwellings, $40,000; A. Filatraux, St. Rose street, Maisonneuve, house containing three dwellings, $3,500; E. Paquin, Cote des Neiges, house containing three dwellings, and one store, $4,000; G. Guindon, 213 Iberville street, house containing three dwellings, $3,000; M. Workman, 326 Notre Dame street west, alterations to dwelling, $2,500; Montreal Street Railway, Craig street west, alterations to building, $6,000.

Nanaimo, B.C.

Among the estimates for the present year, the sum of $6,667.20 is available for roads, streets, bridges and other works.

Ottawa, Ont.

The Department of Public Works will send engineers to survey the proposed new route of communication between Montreal and Lake Champlain and thence by the Hudson to New York.

Tenders addressed to N. Tesier, secretary, Department of Public Works, will be received until April 12th for dredging required in Cobourg, Goderich, Kincardine, Sault Ste. Marie, etc. Specification on application to the above mentioned.

Contracts for supplies were awarded to the following: For Sand—Louis Cousineau & Baptiste St. Jean, 87 cents per cubic yard. Cement—H. Dupuis & Son 45 1-2 cents per 100 lbs. Broken Stone — The Fleming Dupuis Supply Company, bulk, $12,510. Vitrified Clay Pipe—T. Sidney & Company, Scotch pipe on price list, 72 per cent. Stone Setts—T. Sidney Kirby & Company, ordinary block, $65 per thousand; track block, $75 per thousand. Brick The Peerless brick & Tile Company, $8.30 per thousand. Plank and Cedar—W. H. McAuliffe, $11,360. Asphalt—Referred to city engineer for report. The following is a list of details of accepted tenders for supplies: Broken Stone—The Fleming Dupuis Supply Company—1,000 tons limestone, quarry debris, 85 cents per ton; 1,000 tons limestone, run of crusher, 2 1-2 inch and under, $1.20 per ton; 4,000 tons broken limestone, 2 inch to 3-4 inch, $1.40 per ton; 1,000 tons broken limestone, double screened, not exceeding 5-8 inch and under, $1.81 per ton; 500 tons fine limestone, 5-8 inch and under 90 cents per ton; 1000 tons Nepean sandstone 5-8 inch and under, $2.60 per ton. Vitrified Clay Pipe — T. Sidney Kirby & Company—Straight pipe ,per foot 4-inch, 20 cents; 6-inch, 30 cents; 9-inch, 60 cents; 12-inch, $1.00; 15-inch, $1.35; 18-inch, $1.70; 24-inch, 3.25. Single junction, 3 feet long, 4-inch, 1.10; 6-inch, $1.65; 9-inch, $3.30; 12-inch, 5.50; 15-inch, 7.45; 18-inch, $9.35; 24-inch, $17.88. Bends and curves, per foot, 4-inch 65 cents; 6-inch $1.10; 9-inch, $2.40; 12-inch, 4.00; 15-inch, 5.40; 18-inch, $6.80; 24-inch, $13.00. Stoppers, 4-inch, 7 $6.80; 24-inch, $13.00. Stoppers, per foot, 4-inch, 7 cents; 6-inch, 10 cents; 9-inch, 20 cents; 12-inch, 33 cents; 15-inch, 45 cents; 18-inch, 57 cents; 24-inch, 1.08. Slants, per foot, 4-inch, 30 cents; 6-inch, 45 cents; 9-inch, 90 cents; 12-inch, $1.50; 15-inch, $2.00; 18-inch, $2.55; 24-inch, $4.88. Discount allowed on above price list—72 per cent.

Building permits were issued as follows: F. Hassell, 1937 Sixth avenue east, $2,200; J. M Clark, 568 Twelfth avenue east, $2,000; T. Booker, 510 Tenth avenue east, $2,500; J. Burmeister, 3022 Glen drive, $1,700; A. E. Littler, 538 Thirteenth avenue west, $2,500; Union Bank, Cordova street, $12,500; E. Urquart, 2373 First avenue west, 4,000; C. Tullidge, 1946 Sixth avenue west, $2,700; Western Home & Improvement Company, Charles street, between Park and Salisbury, five houses, 12,500; C. A. Gilbert, 1465 Broadway west, $12,000; C. Godfrey, 1175 Eleventh avenue west, $4,500; A. M. Sharp, 1870 Pendrell street, 2,500; W. J. Latimer, 2065 Hastings street, $2,200; C. Carmworth, 356 Fifteenth avenue west, $4,000; Lewis & Marshall, 235 Fourteenth avenue west, 3,800; M. R. Cchram, 1137 Tenth avenue east, $2,200; Geo. Davidson, frame dwelling, 648 Victoria drive, $4,500; Ramsay Bros., frame addition, Powell street, $4,000; P. W. Bell, frame dwelling, 1346 Twelfth avenue, $3,800; H. O. Hatt & Company, 636 Tenth avenue west, two houses, $8,000; Crowe & McDonald, 3230 Point Grey road, $2,800; T. Hewton, 1117 Tenth avenue east, $2,200; A. Whiteside, 2705 Scott street, $2,000; M. Currie, 1556 Graveley street, $3,000; Capt. Capp, 1110 Victoria drive, $8,000; M. Carscallen, 1576 Napier street, $2,700; Mrs. Kidd, 1944 Barnard street, 2,500.

Prince Albert, Sask.

Manville & Company were awarded the contract for cement at $2.98 a barrel; Agnew Bros. the contract for nails; the American Sewer Pipe Company the contract for sewer pipe, and the J. Morrison Brass Company, of Toronto, the contract for fittings.

Regina, Sask.

The following bylaws were carried: Market building, $16,000; Albert street subway, $41,000; waterworks extensions, $10,000; sewerage extensions, $10,000; exhibition grounds improvements, $25,000.

Sydney, N.S.

It is learned that the Sydney Cement Company has completed a contract to supply the Dominion Iron & Steel Company with 12,500 barrels of cement, the Steel Company retaining the option to increase that amount to 25,000 barrels within the year. Sydney Pressed Brick Company have also secured a large order from the Steel Company.

Woodstock, Ont.

Tenders addressed to G. C. Eden, city treasurer, will be received until April 6th for the following long term debentures:—$27,500 4 1-2 per cent. light and power, due December 30th, 1938; $7,000 4 1-2 per cent. consolidation debentures, due November 30th, 1939; $3,000 4 1-2 per cent. park debentures, due December 31st, 1949. John Morrison, city clerk.

Welland, Ont.

Tenders will be received until April 7th for $115,242 four and a half per cent. 10, 20 and 30 year debentures. J. Hamilton Burgar, treasurer.

Winnipeg, Man.

The fire and water committee recommended that tenders be called for a motor hose wagon for the high pressure area of the city.

J. Sveinsson has secured a permit for the erection of a three storey apartment block on the northeast corner of Argyle and Sutherland. Cost $35,000. Other permits include: Forrester & Cook fur factory, east side Fort, between Portage and Granville, six storeys high, 25,000; Manitoba Gypsum Company, two dwellings, east side Dundas, between Alberta and Geneva, $2,000; R. M. Mills, two dwellings, north side Alexander, between Keewatin street and Worth $3,600; Mrs. T. Munro, dwelling, south side Dorchester, between Stafford and Harrow, $4,000; A. G. Davidson, house, north side Rosedale, between Pembina and Nassau, $2,500; W. W. Fleming, dwelling, Chestnut street, between Buell and Ida, $10,800; F. S. Parlu, dwelling, Dundrin avenue, between Walnut and Maryland, $6,500; F. E. Smith, dwelling, Maplewood avenue, between Pembina and Hay street, $4,000; T. Crone, dwelling, Rosedale, between John and Nassau, $2,500; H. Haldorson, dwelling, Aubrey street, between Portage avenue and River avenue, $3,000; John Lenius, dwelling, College avenue, between Powers and Andrews, $2,000.

AWARDED.

Vancouver, B.C.

The contract for the protection of the Pitt Meadows Land was awarded to the Vancouver firm of Ironside, Rannie & Campbell, for 100,000.

Victoria, B.C.

The city council have awarded contracts for material for road and sidewalk work as follows: Filling sand and 20 per cent. of the gravel to the Lineham-Scott Sand & Gravel Company, and the balance of the gravel to the Royal Bay Company. The Lineham company tenders for filling at 88 cents and sand at $1.08 per yard and gravel at $1.35. The Royal Bay Company will supply gravel at $1.15 per yard.

Waterloo, Ont.

The town council awarded tenders fo the construction of the new market building and decided to authorize the issue o debentures to raise the sum of $6,000 fo improvements and extensions in connection with the waterworks plant and $5,00 for extensions and laying of gas mains.

C. Larin & Company, painters, Montreal, have dissolved.

HADSEL

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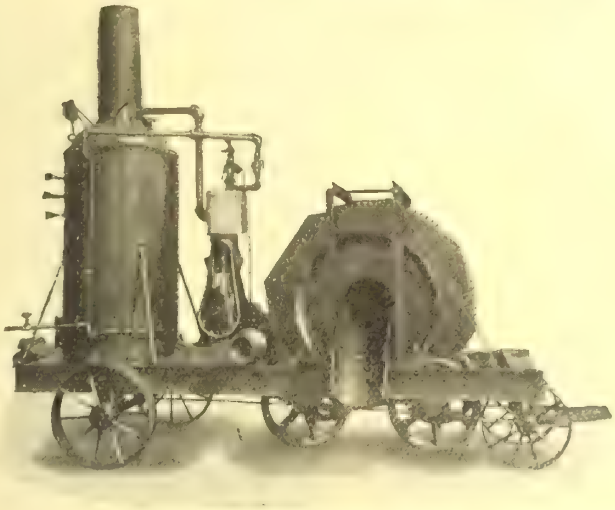

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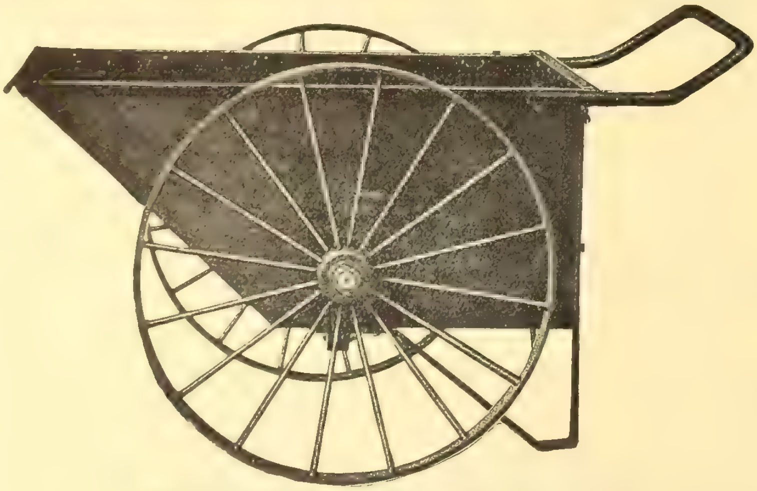

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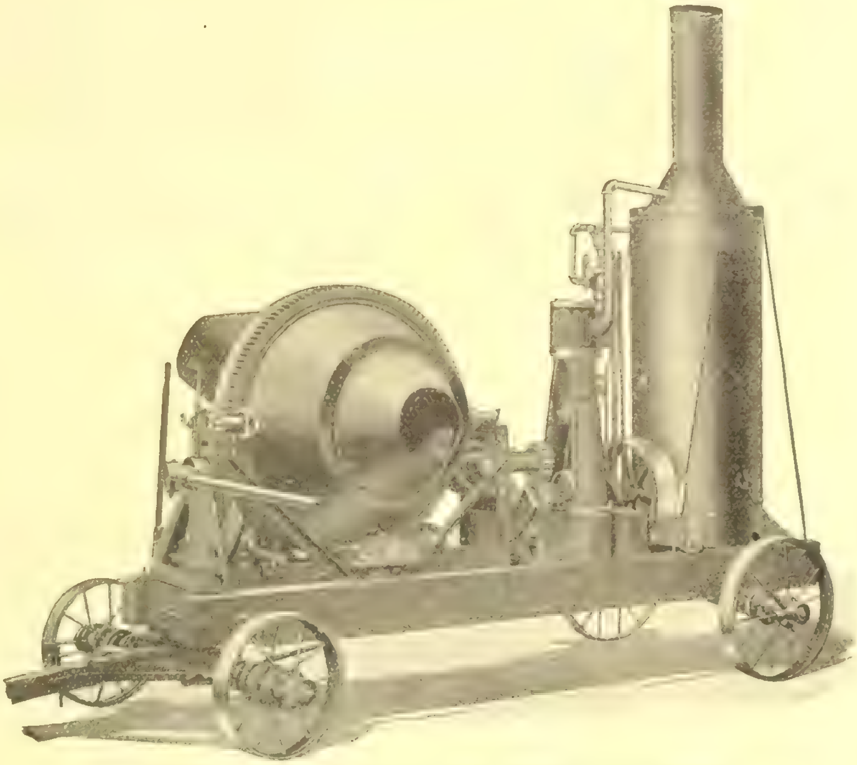

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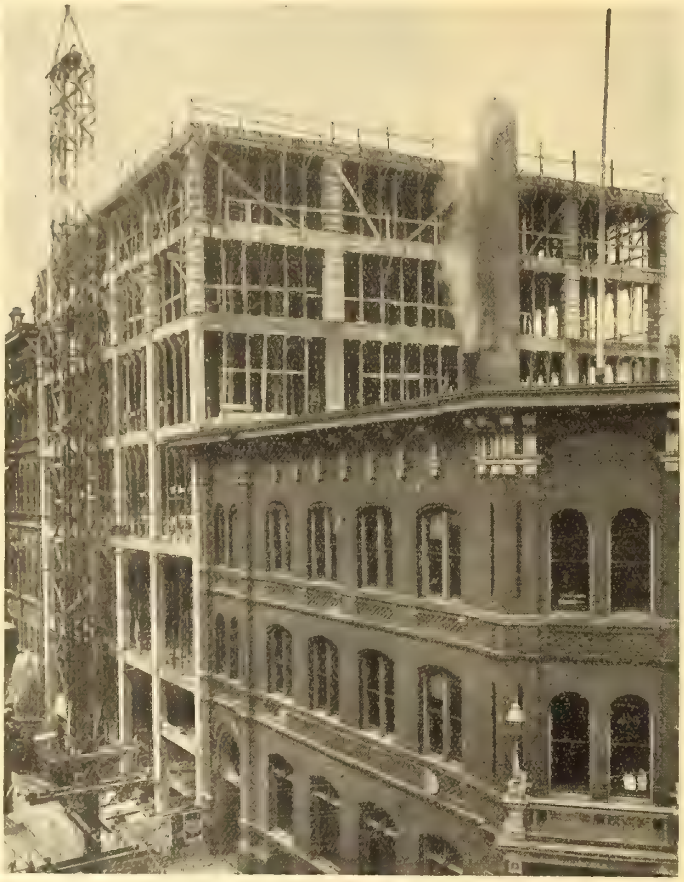

Cut shows Reinforced Concrete Building under construction for the Thomas C. Watkins Departmental Store, Hamilton.

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Civic Improvement at Toronto

The time seems opportune for the appointment of a special commission to do something for the improvement and beautification of the city of Toronto. There has been considerable discussion along this line in recent years, and most people seem to be alive to the fact that the city lends itself exceptionally to artistic and enlightened improvement planning — moreover, several interesting schemes have been put forward, but the fact remains that very little has been done and the seasons come and go with practically nothing accomplished. An object of this kind should appeal to a young and energetic man like Mayor Geary.

An example was provided recently by the city of Montreal, which endorsed the proposal of the City Improvement League to apply to the Quebec Legislature for the appointment of an independent commission of five members to work for the improvement of the city and district, for the provision of better means of street communication and transit, and for laying out suitable parks and recreation grounds. This new board will be known as the Metropolitan Parks Commission. Not that the name means much. The point is that the city will have a properly constituted and financed body striving not only for a "Greater" but for a "Better" Montreal, under a concerted system of development.

Without considering the efforts that are being expended in this direction across the border, and to go further afield for another recent example we have the action of the French Parliament in passing a bill authorizing the city of Paris to contract a loan of no less than $180,000,000 for the embellishment and sanitary improvement of Paris. The programme submitted in this connection is one of the most ambitious ever considered. Nearly $20,000,000 will be appropriated for the improvement of school buildings; large sums will be spent in the paving of streets and promenades; municipal buildings will be repaired or rebuilt; old buildings will be demolished to make room for new structures, and streets of squalid, unsanitary buildings will give place to flowering gardens and waving grasses.

It would not be necessary for Toronto to involve itself to this extent. Neither perhaps would it be advisable to undertake the work with any lofty scheme in view, but certainly a commission should be appointed to give some consideration to the matter.

Municipalities Waste Valuable Time

It is to be hoped that the municipalities which have sewer, paving or other street work, or public buildings in view, will take time by the forelock and dispose of all possible preliminaries before the active construction season is very far advanced. Every year it is the experience of some communities to have the first half of the season wasted in the preliminaries which ought to have been done during the winter. Dilatoriness of this kind is the bane of municipal contractors. Tenders should be asked ahead of time so as to afford the proper opportunity for carrying out the work satisfactorily and reduce the risk and annoyance attendant upon "scamping."

Proposed Standard for Cast Iron Pipe

The Gartshore-Thomson Pipe & Foundry Company, Limited, Hamilton, Ont., write: "In our opinion the question of having a standard specification for cast iron pipe is a matter for the engineers to decide."

The National Iron Works, Limited, Toronto, Ont., write us as follows: "The standardization of cast iron pipe would be of direct benefit both to engineers and manufacturers, but would require the absolute co-operation of both parties to be a success. The American Waterworks Association have drawn up a specification which should be satisfactory to the most exacting engineer."

One of our leading city engineers writes:

"My opinion is that a standard specification is desirable, and would lead to economy in the production of pipe. It will, however, be necessary that the manufacturers consent to, and be in full sympathy with any specification adopted by the Canadian Society of Civil Engineers, before the same can become universally adopted. It is the intention of the Canadian Society of Civil Engineers to endeavor to arrive at a thorough understanding with the manufacturers before deciding upon a standard specification. Though the arrangement of a standard seems a simple matter it was a good many years before the various societies in the United States could agree. In fact, there are still, I believe, two standard specifications in use there."

Rural Sewage Disposal and Water Supply

A Simple, Safe and Sanitary Manner of Disposing of Domestic Sewage Description of Pneumatic System of Water Supply*

In the matter of public sanitation, the question of disposing of sewage in small towns and villages, as well as in less populated districts, where by reason of its great cost a general syste mof sewerage is impossible, is daily becoming of greater importance, and as the title of my paper would indicate, that is the phase of the question with which I propose to deal. The system to which I intend to refer is known as the septic tank system, and I believe that nearly all who have studied it are agreed that it is at once the most natural, most scientific, simple and economical system in use to-day, and speaking from a personal knowledge of scores of these systems, I am in a position to say that it is worthy of all the good things that are said about it. I have prepared a few sketches by means of which the fundamental principles that govern it may be the more easily understood, for the benefit of those who may be in need of information on the subject, and in order to emphasize the necessity of carrying out every detail in constructing a system as hereafter described. It is a matter of common knowledge that living earth—or top soil—is a powerful purifying agent, but comparatively few are aware that the presence in it of countless numbers of bacteria, or microbes, is alone responsible for the chemical changes brought about in waste matter placed beneath its surface, and that these bacteria, through their action, not only remove and destroy the dangerous properties of such waste matter, but actually convert them into plant food, which, being taken up by the vegetation, is again consumed for the sustenance of life.

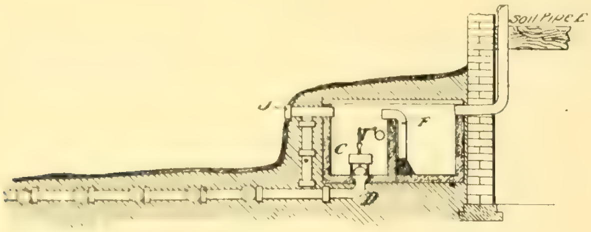

Fig. 1

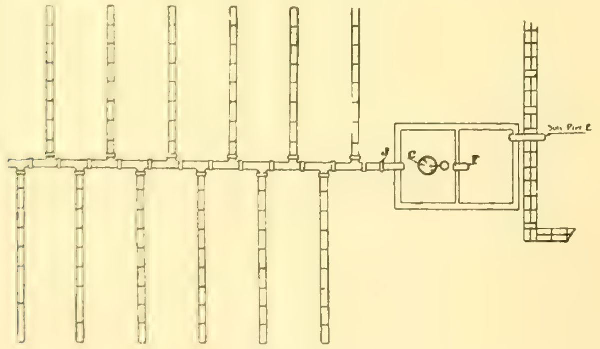

Fig. 2

Pasteur divided these microbes into two classes, viz., anerobes, or those which lived apart from air, and derive their oxygen from decaying compounds, and aerobes, or those which require plenty of fresh air for their development, and as both classes are considered necessary for the complete reduction of waste matter, it will be seen that if sewage is placed too deeply in the earth, as, for instance, in a cesspool, where, owing to the absence of air, the necessary aerobic bacteria cannot exist, it may pass down deeper in a putrid state, and finding its way to the water supply, not infrequently results in an outbreak of typhoid fever or some other intestinal disease. The two classes of microbes referred to have properties somewhat differing from each other, but the net result of their work under proper conditions is the breaking down of the solids in the sewage, the disintegrating of its constituents and the conversion of the whole into liquid and gases, in which form it leaves the septic tank, the former to be distributed under the surface of the earth, where by reason of its contact with free oxygen, bacterial life is most active, there to be still further reduced and finally converted into nitrates, which are readily taken up by the vegetation on the surface, and the latter passing up high into the air, as hereafter described. With this brief reference, then, to the principles of the system, I propose to indicate how it should be constructed.

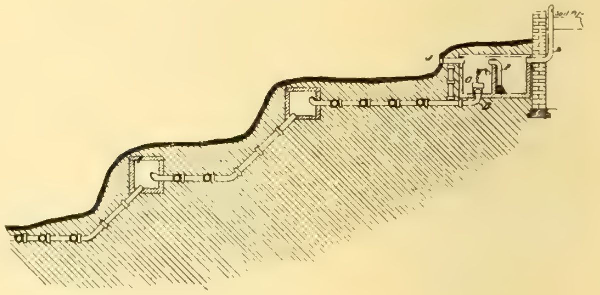

Fig. 3

In fig. 1 is shown a section of a complete system built on level ground, with the tank placed close to the wall of the building—where, in fact, the large majority of those now in use are located. The tank should be built of brick or stone, laid in and lined with cement, or of solid concrete, the main object being to have it impervious to moisture. It will be noticed that the tank is divided into two compartments, an overflow pipe "F" being built into the dividing wall, the mouth of the said overflow being within seven or eight inches of the bottom of the tank, and being covered with a wire screen about the size of an ordinary pail, the mesh of which screen not exceeding three-quarters of an inch .

The main soil pipe is represented by "E" and should be directly connected with the closet, bath, sink, etc. It extends from the same compartment in which the overflow is placed, to a point two or three feet above the roof, acting not only as a conductor of sewage to the tank but also as a channel by which any gases in excess of those in solution may pass out to the atmosphere at a height which renders it impossible for them to inconvenience the occupants of the building. "J" in the second compartment admits fresh air, which passes freely over the centre partition—spaces being left in the top of the latter for the purpose—and up through the soil pipe to the roof. In the centre of the second compartment is placed an automatic valve, "C," which is caulked into a four-inch cast iron bend, as ordinarily used by plumbers, and which is securely built into the bottom of the tank during its construction. The top of the hub of the bend is usually left slightly lower than the level of the floor of the tank. From the said iron bend is run a line of glazed tile pipe, four inches in diameter, having a connection with the fresh air pipe, for the purpose of ventilation, and a number of openings placed at intervals of two feet or more, from which are run branches of four-inch field tile with loosely butted joints.

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*Paper read before the Central Railway and Engineering Club, by Mr. M J. Quinn Manager of the National Equipment Company, Toronto.

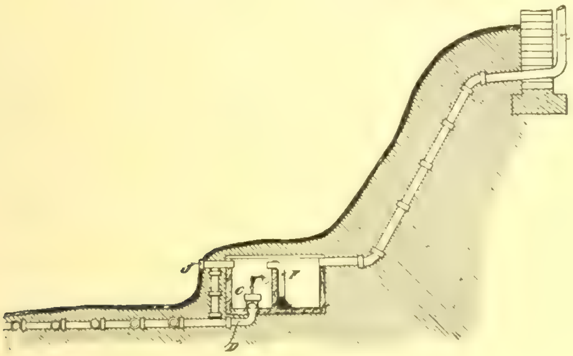


Fig. 4

Fig. 2 shows a plan of the whole system and illustrates one way in which the tile may be laid, though as will be manifest, they would do equally well if all laid on one side of the main carrier in any number of branches, of any length, providing a sufficient number in the aggregate are laid, and the rows are not placed closer together than two feet in light soil, and a somewhat greater distance in heavy soil. The field tile should not be placed more than one foot below the surface, and must be perfectly level, for the reason that if given a fall the earth surrounding the low ends of the system would receive more than its share of liquid sewage, and would in time become fouled. While, if level, the earth surrounding every tile has an equal amount of work to do, and will produce most satisfactory results.

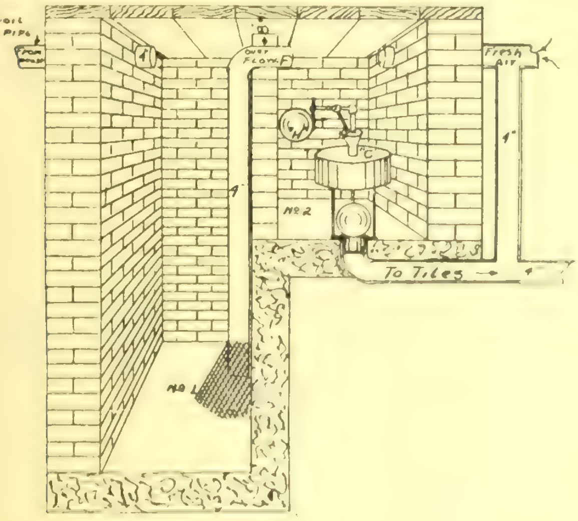


Fig. 5

Briefly, then, the operation of the system is as follows:—

The sewage from the building enters through soil pipe "E," filling the first compartment, in which all solid matter is retained until it is reduced by the contained bacteria, which multiply and develop very rapidly. In a liquid form it is allowed to enter the second compartment through over-flow "F," which is turned down because of the presence of the bulk of the organic matter in suspension on or near the surface. When the liquid has risen in the second compartment to the height at which the unlocking float on the valve has been set, the valve automatically opens and discharges the contents of that compartment, be it 50 or 1,000 gallons, into the system of field tiles, through which it percolates into the surrounding earth, to be taken care of by nature as already described. The valve is made to discharge liquid sewage at a maximum depth of 24 inches, and a minimum depth of 17 inches, and the top or unlocking float may be set at any point between these two levels. As the tank takes from 12 to 24 hours to fill, it will be obvious that there will be abundance of time in which the water in the tiles may soak away before it again discharges. To prevent the gases of decomposition escaping through other than the proper channel, the tank must be covered first with rough plank, and then with five or six inches of earth, which, in turn, if desired, may be sodded over. In figuring out the size of tank necessary, the following may be taken as a safe rule, viz.: for every occupant of a private house or hotel, allow three cubic feet of space in each compartment, while for a school or factory, where, as in the case of a house, nothing but domestic sewage is to be treated, one-third less space will be sufficient, and for every cubic foot in one compartment (or one-half the tank) lay 18 feet of four-inch field tile. It will be obvious that, as in the case of ordinary stable manure, human excreta, if deposited in its solid state just below the surface of the earth, would entirely disappear in a very short time, and the system just described is merely a most convenient and sanitary way of automatically accomplishing that very desirable result, and the accompanying advantage of not only depositing it in the earth partially treated, but in a much more favorable condition to receive final treatment than would possibly obtain if the former method were adopted.

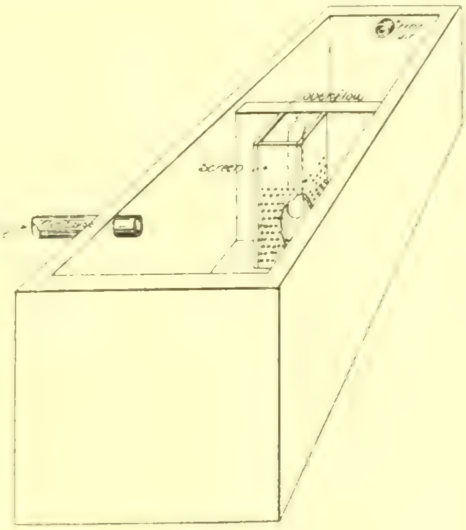


Fig. 6

Anticipating the difficulty which will be encountered where there is a considerable fall in the ground surrounding the building to be drained, I would refer you to Fig. 4, which shows a number of terraces each receiving a portion of the effluent from the tank. It will be noticed that the end of the glazed tile is turned up a few inches on the brow of each terrace, the result of which arrangement being that all the field tiles at each level will fill before the sewage can rise and overflow to the tiles on the next lower level, where the same operation takes place, and so on for any number of terraces, and as will be apparent, the sewage passing into the tiles on a high level cannot possibly escape to those lower down, so that the earth surrounding every tile will have its full complement of work to perform.

Fig. 4, the horizontal scale of which is somewhat exaggerated, shows the proper relative position of the tank to the house where the field tiles have to be placed on a level considerably below that on which the building stands. In such a case it will be evident that were the tank placed on the high level, the discharge would come down with sufficient velocity to wash out both earth and tiles, while the discharge from the house to the tank, as shown, will not have any injurious effect on the latter. It sometimes happens, where large tanks are required, as, for instance, in schools, factories, etc., that ground room is limited and it would prove difficult to install a tank of the proper cubical contents and a maximum depth of not more than three feet. In such a case it is permissible to build compartment No. 1 as deep as five or six feet, giving it the same cubical area as No. 2, which, however, in no case should exceed three feet in depth, such an arrangement is shown in fig. 5, which also shows that the overflow pipe is carried to a point as near the floor as it would be if the tank were shallower.

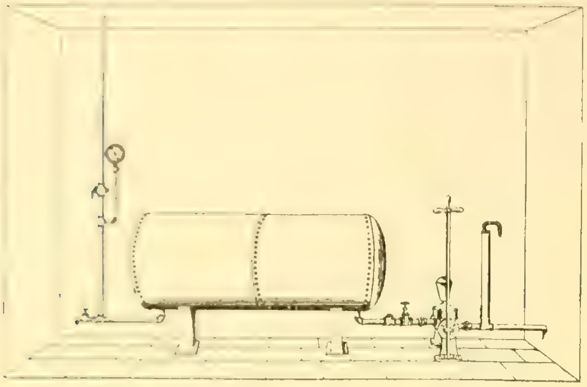


Fig. 7

The arrangement of the overflow screen, shown in fig. 6, has proven to be a very satisfactory one. As will be plain, it is merely three pieces of board, which, with the cement partition, make a box about ten or eleven inches each way inside. It is closely perforated with ¾-inch holes up to a height of about eighteen inches and is secured in place by a couple of pieces of wood reaching to the opposite side of the tank. It has the advantage of longer life than the wire screen and of being easily removed should occasion at any time require it.

In answer to a question which arises in the minds of most people who have given consideration to the system, I may say that it will not freeze in winter, even when the frost penetrates the ground for several feet every where except where the tiles are laid.

In conclusion I would simply refer to a few of the principal points which should be kept in mind in constructing such a system, viz.:

Have the tank covered with a few inches of earth, to prevent the escape of gases, except through the soil pipe stack. See that the valve discharges at least once before the tank is covered in. See that no trap is placed on the main soil pipe to prevent the free passage of air across the tank and up to the roof, and that the necessary space for the air is left in the top of the centre partition; and, finally, take care that no disinfectants or chemicals of any kind are allowed to enter the tank, if the life of the bacteria, upon which the system depends for its success, is to be preserved.

Water Service Systems for Rural Homes, Institutions, etc.

As has already been noted, the tendency on the part of those living beyond the confines of thickly populated districts to demand facilities for the promotion of both comfort and health equal to those, which, until comparatively recent years, have been enjoyed only by those living in large cities, has been annually increasing, and to such an extent has success crowned the efforts of those who set about devising methods by which these very reasonable demands might be satisfied, that it may be safely said that in respect to sewage disposal, water supply, artificial lighting, etc., the rural resident may enjoy at no great cost all of the advantages possessed by urban residents.

The question of sewage disposal having been dealt with, a brief description of the most approved and up-to-date method employed to provide a first class water service system may not be out of place, and I present further illustrations, with the assistance of which the theory of what is known as the pneumatic water system is clearly demonstrated. Until very recent years, where any attempt was made to introduce a water supply into a building, where a regular water service was not available, it was the practice to erect a reservoir on the top of either a house or barn, or else on the tower of a windmill, or on one built especially for the purpose. This method, however, had many inherent disadvantages, among which were the absence of reasonable pressure, the effect of the atmospheric temperature during both winter and summer—particularly where the tank was placed in the house or barn, of birds, bats, vermin, etc., being drowned and contaminating the supply, not to speak of the constant contact of the water with dust, bacteria, and bad odors. Another important drawback was the liability to leakage, and the consequent damage where the tank was placed under the house roof, to plaster and decorations below. Then, again, special protection had to be made for carrying the sometimes enormous weight of water stored in large tanks. All of these difficulties and disadvantages have been overcome by the use of the pneumatic water supply system, which has been in use in the United States for 16 or 18 years, and is already becoming quite popular in many sections of Canada.

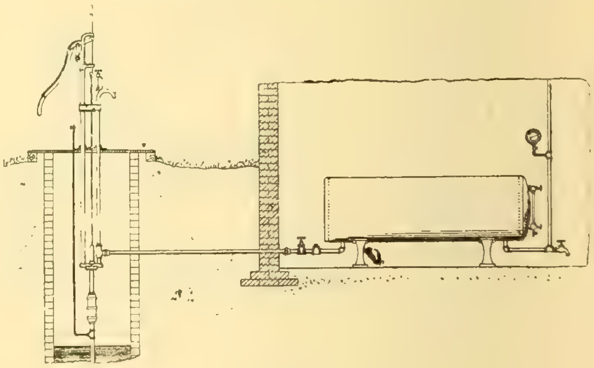


Fig. 8

In fig. 7 is shown the simplest type of the system under discussion, which consists of a pump with necessary connections and a perfectly air-tight tank to the bottom of which is connected two pipes, one to convey water from the pump to the tank and the other from the tank to the plumbing fixtures in the basement and upper floors. Such an arrangement constitutes a pneumatic system. As the water is forced into the bottom of the tank and begins to displace some of the air, the latter is compressed into an ever decreasing space, creating a force known as pressure, and if a tap connected to the discharge pipe in the basement were opened all of the water in the tank would be forced out by the compressed air again expanding to its normal volume. The inlet and discharge pipes from the tank being connected to the bottom thereof absolutely preventing the escape of the air until all of the water has escaped. As you are aware, for one pound of pressure indicated by the gauge, water can be forced up through a vertical pipe to a height of 27 inches. Therefore, 60 pounds pressure will elevate water 135 feet above the tank. So that while all of the water would be discharged from a basement tap, a less amount would be discharged from the fixtures at a greater elevation

With an absolutely air tight tank, the contained air can be lost only in one way, viz.: its absorption by the water due to temperature variations in the latter. As a rule, loss due to this cause is almost infinitesimal. Provision is made, however, for the supply of more air when such becomes necessary, by one of three methods, viz :

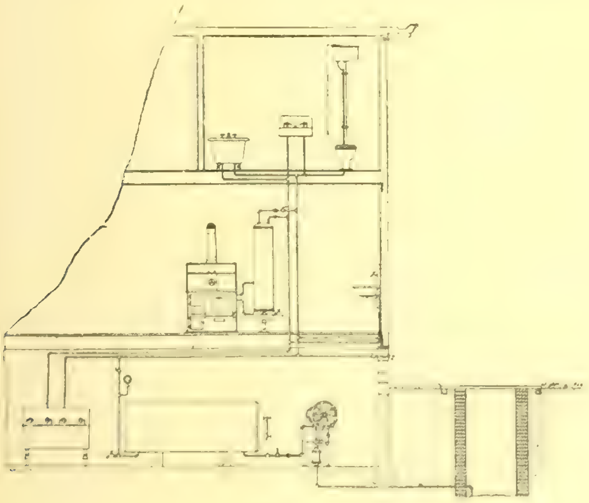


Fig. 9

First, at a convenient point on the suction pipe is a small stop cock, or check valve, which may be opened by hand when occasion demands, permitting the entrance of a small amount of air with the water being delivered into the tank. The second method is by means of a combination water and air hand pump, which is ordinarily supplied with these systems. The third method, which, however, need only be considered in connection with a system of considerable size, is a special air compressor, worked either by hand or from a counter shaft, as may be desired.

The necessity for having an absolutely air tight tank can scarcely be exaggerated, for, as will be clear to you the continued successful operation of the system depends upon retaining the air cushion at a high state of efficiency. For example, if a tank loses a few cubic inches of air per day it will only be the matter of a short time until the efficiency of the system will be materially decreased; the amount of water which may be obtained from the tank being decreased just to the extent that the air has been allowed to escape, and every one familiar with the building of tanks is aware that the ordinary storage tank which would be tight under water pressure, is very unlikely to hold air, for the same reason that a wire basket which would hold potatoes would not hold sand.

One of the advantages of the pneumatic system is the fact that almost any desired quantity of water may be stored because a foundation in the ground is easily obtainable, whereas a most expensive substructure may be necessary in the case of an elevated tank. Another is its electricity, for if at any time, owing to increased requirements, an additional supply is needed, it is only necessary to connect up one or more tanks of any size that may be desired, using only one connection between the additional tanks and the previously established system, as will be obvious, the water will come back from the tank through the pipe by which it entered. Still another advantage is the possibility of having a considerable quantity of water at high pressure in case of fire. Every year many serious fires might be prevented if an adequate supply of water had been available during the incipient stage.

The pump shown in fig. 7 is of the type used where the source of supply is 20 feet or less below its base. Fig. 8 illustrates the type of pump used where water is found at a greater depth than that mentioned, and is built on the well known principal which permits the placing of the cylinder within a few feet of the water, no matter how far below the base of the pump it may be found. Fig. 9 illustrates the conventional house plumbing system furnished with water from a pneumatic tank located in the basement. In this case a hot air engine is the motive power, but as will be obvious, a pump operated by hand, gasoline engine, electric motor, etc., may be substituted therefor. The electrically operated pump, equipped with an automatic controller, is undoubtedly the most convenient type of pumping apparatus used in connection with this system.

There are various types of automatic controllers, several of which can be absolutely depended upon to provide any range of pressures required. The usual deferential being 20 to 30 pounds, allowing for a maximum pressure of 50 pounds, and a minimum pressure of say 25 pounds. Thus the motor is not started too frequently and the system requires no attention whatever on the part of the owner beyond oiling his motor and pump at regular intervals.

These systems are provided with tanks ranging from 140 gallons to 20,000 gallons, the larger size being the practical limit, so far as space is concerned, of the ordinary freight car, so that where greater capacities of water are needed, two or more tanks may be connected together.

The following verdict was returned by a Winnipeg jury last week: "We find that the deceased was killed by the collapse of a portion of the roof of the Union depot, in the city of Winnipeg, on March 12th, 1910, shortly after the noon hour, while working for the Lyall-Mitchell Construction Company. We strongly recommend that in future a stringent test be made as to the proper setting of all cement work utilized in construction of buildings in Winnipeg."

Mr. W. A. Littlejohn, city clerk of Toronto, has returned to the office after a vacation of two months in Bermuda and the Southern States. Mr. Littlejohn is much improved in health.

We regret to report the death of Mr. Robt. L. Pettigrew, a well known building contractor and an old resident of Toronto.

Use of Concrete in Factory Construction

Its Advantages and Disadvantages— Its Wide Application, and its Limitations— Conditions under which it is not Economical to Build of Concrete

By H. F. Porter, C. E.

Portland cement in its various applications is by no means a cure-all material for factory construction. No material will ever meet all conditions. But cement does possess unique advantages and offers possibilities in detail construction that are becoming more generally understood. And cement either alone or reinforced with steel is adaptable not only for new factory construction and for additions to old buildings, but for the construction of many small details in the factory — machine foundations, retaining walls, cisterns, shipping platforms, stairways, and so on.

For these various purposes concrete has both technical and practical advantages and disadvantages. Technically, the composition of concrete gives it advantages over any other material of construction. No other material admits of such scope in design or construction. Its application is limited only by the ingenuity of the designer and the skill of the constructor. Its plasticity makes it applicable to any form in any position, and its strength when hardened and scientifically reinforced with steel is equal to the most exacting demands.

Concrete gains constantly in strength, whereas all other materials progressively lose, requiring an ever increasing amount of money to be spent for repairs and ultimately complete replacement. Tests on cement briquets show that a block of cement twenty years old is fifty per cent. stronger than a block one year old. This valuable property of resistance arises from the immunity of its constituents from the ordinary agents of deterioration. It has been shown repeatedly that the steel used for reinforcement in concrete, moreover, is rust proof. A very thin skim of cement seems to afford adequate protection against rust, and even if the steel is coated with a film or rust when it is embedded in the concrete, it loses what it has and is smooth and bright when removed.

Cement resists abrasion and has great compressive strength, therefore is particularly adaptable for foundations, retaining walls and all work of a massive nature where the forces internal and external are mostly compressive. But for purposes where the material is brought into tension, as in beams, arches, lintels and slabs, and where the temperature strains are considerable, concrete of itself is insufficient, and it is necessary to combine it with a material strong in tension.

Steel, the strongest material in tension, admirably fulfils this need. The coefficients of expansion of the two materials are practically the same, so that they change length simultaneously; the concrete in changing from the fluid and plastic state to the solid state shrinks slightly and grips the steel tightly. In fact, steel embedded in cement and concrete will break in two before it will pull out.

Reinforced concrete has all the properties of cement together with the properties of concrete as a building material. It is strong in compression and in tension.

Another technical advantage of concrete as a material of construction is that it resists heavy shocks. The vibratory effect of a heavy shock produces no appreciable effect on a concrete floor beyond mashing it a bit at the point of contact. A similar shock would cause a tile floor to fly into many pieces and a wooden floor to split and splinter. On a concrete floor the shock seems to be widely distributed, and therefore no one point receives the brunt of the blow. Engine foundations and floors for carrying heavy machinery can consequently be built of concrete to good advantage. In one factory in which concrete floors have been used, heavy presses are used on the upper storeys without resulting vibration.

Concrete, if properly made, is practically impermeable, and if not in every case waterproof, it is at least moisture and damp proof. It is also virtually immune to the action of corrosive gases in the atmosphere and to oils and acids. Strong acid does attack concrete, but the effect is usually confined to the etching of the surface; in fact, acids are frequently made use of to secure an artistic effect on the surface of the concrete. The extent of the penetration of the acid when used in this way depends largely upon the nature of the aggregates, as the crushed rock and sand, with which Portland cement is mixed to form concrete, are technically known. If these aggregates are composed of siliceous or igneous rock, the effect of the acid is very slight; but if the aggregates are of the nature of a limestone, a strong acid will in time entirely ruin the concrete. This is a point to be remembered when making concrete. Only the best material should be used in mixing the concrete. Oil may rot cement, but only if the surfacing is poorly done; as a matter of fact, linseed oil is frequently used to keep cement from "dusting" and to increase the smoothness and impermeability of the surface.

But concrete construction naturally enough has its limitations and there are honest objections to it. The chief limitation of concrete is due to its dead weight. There is a practical limit to the height of structures and to the length of span of horizontal members. In the second place, the very fact that concrete is permanent makes it difficult to alter.

Concrete Not Economical Under Some Conditions

But while the dead weight of concrete is its greatest drawback, this limitation does not hold in many factories, because factory buildings are not skyscrapers. It is not practicable on account of the dead weight of concrete to erect buildings on soils which have low bearing value, and for tall structures the girth of the piers on the lower storeys is not only unsightly and uneconomical but often seriously encroaches on the available floor space. This difficulty has been overcome in several instances by using cores of steel for piers on the lower storeys, thereby reducing the girth of the piers to a convenient and uniform size throughout the building. This, of course, increases the first cost, but the gain in floor space and sightliness more than offsets this.

A more practical limitation of concrete in factory work, due to its dead weight, is its unfitness for long girder spans. Up to 50 or 60 feet it is both feasible and economical to build spans of concrete, but if the girders have to be longer than this, it is generally advisable to use steel girders or trusses. Also for roof spans of one storey mill building steel girders are generally advisable.

There is a system of high, concrete girder construction which claims to solve the problem of long-span concrete construction. While this fact is yet to be demonstrated conclusively, it seems promising. Roof trusses, too, have been fashioned of concrete, but this is more the vogue abroad than on this continent, where up to the present time it has not been found economical to attempt such construction.

The second technical limitation of concrete — its permanence — makes it necessary to design the building very carefully. If a little foresight and sound judgment is used in planning the building, a slight additional outlay at the start for stronger piers and foundations will permit of the addition of extra storeys or extensions laterally or lengthwise. In general, partitions may be placed at will in a concrete structure and special alterations which involve the body of the building, although difficult and costly, are not impossible.

Concrete Factory Buildings will Meet Future Conditions

If it is desired to put up a single storey structure of great roof span, the excessive cost of centreing for such a building may make it an uneconomical form of structure. But even in this case by the exercise of a little compromise and ingenuity concrete may be made economical and practical. In one plant, the difference in the time of building determined the use of the concrete, even for the saw-tooth roof structure. But by combining a self-sustaining reinforcement in combination with an underbody of structural steel the internal centreing was eliminated. The concrete was poured directly on the reinforcement, and the under side was plastered up with cement mortar. This formed a strong, durable and economical decking and, while the structure as a whole on account of the exposed underbody was by no means as fire and decay proof as an all concrete building, it was fairly substantial and permanent.

The practical advantages of concrete are many. Without going into detail concerning the initial cost, the final cost, the saving in time of erection and reduction of fixed charges, the practical advantages which follow from the technical advantages of concrete as a building material often outweigh the technical advantages.

No material of construction affords greater possibilities for a well lighted building than does concrete. The combination of large window and skylight area with light colored or white interiors makes it possible to get the maximum of daylight. In fact, with concrete as a building material there is apt to be too much light rather than too little.

That a material so smooth and impermeable ranks high from the viewpoint of sanitation is self evident. No construction is so easy to keep clean. The floors and walls of a concrete factory can be washed and kept as fresh as when new.

Concrete buildings are naturally cool in summer and warm in winter on account of the low conductivity of the material. A gas jet has been known to keep a good sized room comfortably warm in a concrete house during a northern winter.

Because a concrete structure is stiff and free from vibration it is peculiarly adapted to the requirements of manufacturing in which the stability of machines is an important consideration. It not only saves the wear and tear on machinery, due to vibration, thus increasing its life and usefulness, but it also facilitates the operation and in this way is an aid in reducing factory costs.

Because of the solidity of the concrete flooring in a factory it is possible to arrange and rearrange machines to great advantage without taking into consideration special foundations. Machinery in a concrete building can be located above the floor and the shafting below and it is perfectly possible to build concrete floors of such uniformly distributed strength and stiffness as to permit the location of the operating apparatus in groups and units and to make the most effective utilization of the floor space.

More Economical to Construct Concrete Buildings in Warm Weather

The most practical limitation in the application of concrete lies in the difficulty, danger and expense attending the construction of a building of concrete during cold weather. Not that it cannot be done with entire safety, but the extra expense involved, due to the precautions necessary to protect the concrete from the action of the frost and the decreased efficiency of the workmen on account of the cold, may run the cost of a concrete building up anywhere from 5 to 50 per cent.

One of the prime advantages of concrete is that it can be put up quickly in favorable weather with a good organization in charge and urged on by the spur of necessity; and it is questionable if it ever pays, for the slight gain in time, to attempt operations at the approach of the winter season or to carry over into the cold weather any work that can safely be left incompleted.

Another practical objection to concreting in the winter time is the length of time required for the concrete to set. Because the cement sets very slowly in low temperatures much additional money is tied up in centres.

In one instance it was possible to uncentre and use a floor cast in April sooner than the one below it cast in February. Moreover, the floor cast in April was installed in one-quarter of the time and at half the expense of the one in February. In this instance it would have been far wiser to have postponed the entire work until April.

On the other hand, in another building just the opposite was true. The building was partly up but was requiring so long a time to erect that it became necessary to push the installation regardless of the weather, and the extra expense involved was more than compensated for by the saving in time.

Some Conditions Unfavorable to Putting Up Buildings of Concrete

Extremely hot weather also is unfavorable to concreting, as concrete has been known to set under the influence of a boiling, noon-day sun of midsummer before it could be placed in a mould.

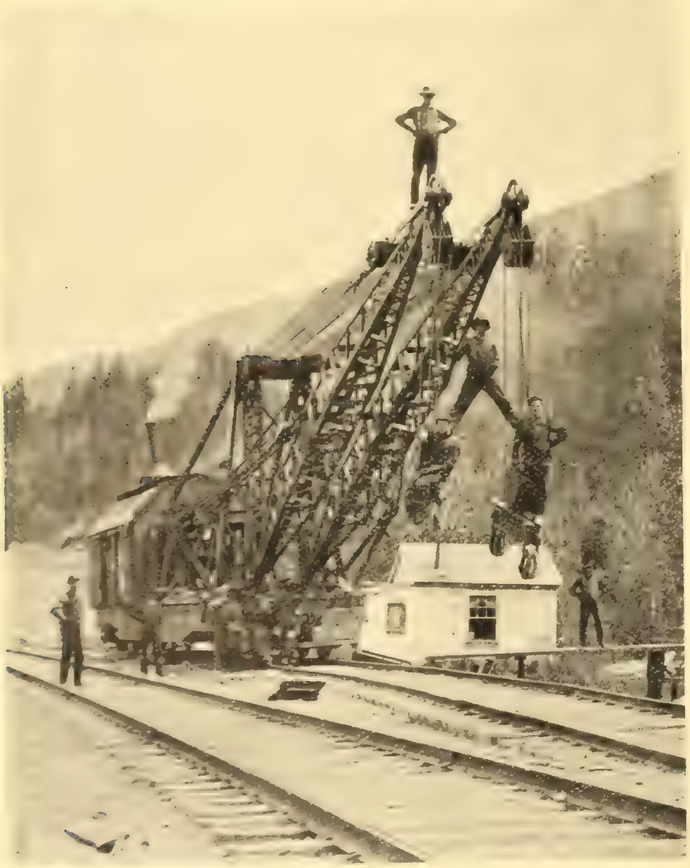
All these conditions should be taken into consideration when considering the time of the year in which to put up a new plant. As a prominent architect stated recently, architects see with concrete the realization of their fondest ideals of design. But great care should be exercised in the planning and executing of a concrete building. Because of its very simplicity and its apparent ease of construction, concrete has been misused in a number of instances.

Word has been received from Trieste, Austria, of the death of Mr. Edwin Doidge, a well known building contractor of Winnipeg, who, accompanied by his wife, left the western city on December 27th last for a European tour, from which he expected to return about the middle of May. Particulars of Mr. Doidge's death have not come to hand. The deceased gentleman was one of the [illegible] contractors of western Canada. He went west with the Red River expedition in 1870. In recent years he was successful in obtaining many important civic contracts. Mr. Doidge held the rank of major in the [illegible] Field Battery and was a member of the Masonic Order.

Interesting Bridge Work in the Rockies

Constructional Difficulties Encountered in the Erection of Two Viaducts on the Boundary Division of the Canadian Pacific Railway

The accompanying photographs were taken during the construction of some interesting bridge work completed recently by the Hamilton Bridge Works Company, Limited, on the Boundary section of the C.P.R., in the Rocky Mountains, about 30 or 40 miles from Nelson, B.C. The two bridges erected were duplicates in almost every respect.



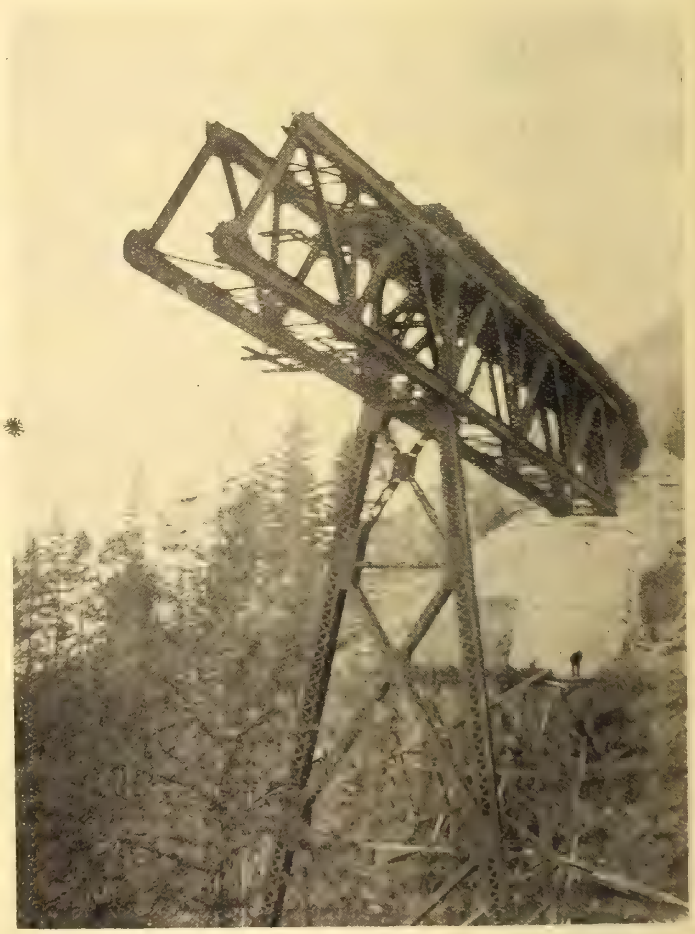
No. 1. Derrick Car and Gang—Showing Compresser Car, to left of Picture

Owing to the location and the abrupt slopes of the canyons over which the structures were to be erected and the fact that the distance from the top of the bridge to the bottom of the ravines was between 150 to 200 feet in depth, the work presented more than the usual structural difficulties encountered in railway work of this kind. Under the conditions, it was practically impossible to use false work for the centre span. Consequently, practically the whole work was put in with one of the company's large steel erection cars. (See illustration No. 1).

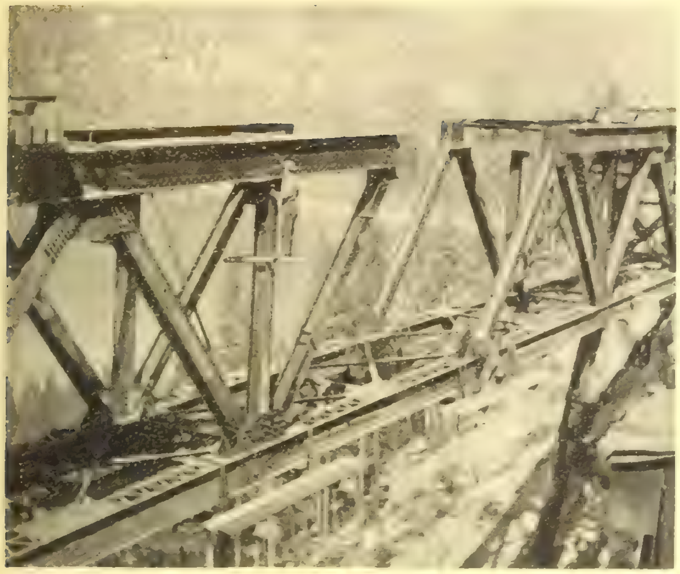
Each bridge has a total length of 410 feet and consists of two 40-foot deck plate girder spans, two 100-foot deck lattice spans, and one 130-foot deck lattice span in the centre of the structure. The two 40-foot girders and the two 100-foot deck lattice spans were erected on falsework in the usual manner, all the steel and falsework being placed in position by means of the erection car. The 130-foot span, however, was erected as a cantilever, working out from each side—shown in illustration No. 2. This photo also shows one end of the 100-foot span and one end of the 130-foot span resting on a steel bent, 90 feet high. At this time practically one-half of the 130-foot span was assembled and the erection was also proceeding from the opposite side of the ravine. Illustration No. 3 shows the final connection in the bottom chords of the cantilever span being made. The top chord members were then immediately filled in. It is interesting to note that calculations were made for this span to come together in correct position under certain temperatures, and when the connecting members in the centre were made ready to place in position, it was necessary to make only very slight adjustment from the anchorages at each end. The fourth picture shows one of the structures completed ready for traffic.

As may readily be understood, one of the difficulties of handling work of this nature is in carrying it on so as not to interfere with traffic or existing structures. The erection car facilitated this greatly, and the contract was completed with no hindrances of this kind. Another feature of the work is that the structures were erected on a curve and provision also had to be made for grade. The total tonnage of steel in each of these bridges is about 500 tons.

The first picture gives a fair illustration of the large

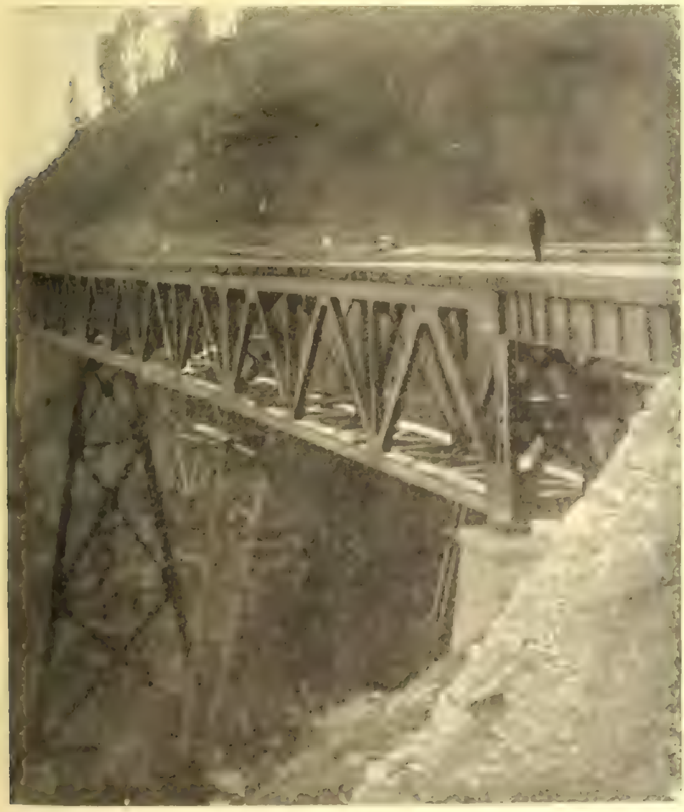


No. 2. The 130 ft. Span in Course of Erection



No. 3. Making the final connection in the bottom chords of the cantilever span

steel derrick erection car used on the work. This car is one of four owned by the company. The first was designed by and built under the supervision of the late chief engineer of the Hamilton Bridge Works Company, Mr. Charles G. Milne, and all are practically duplicates. The frames or bodies of the cars are heavy steel girders, 60 feet in length and 33 inches deep. The width of the deck is 10 feet. The whole structure is mounted on special trucks of 150 tons capacity. This car is self-propelled by a special sprocket and chain device which has given great satisfaction. The power is furnished by a four-drum Beatty hoisting engine, having spools or nigger heads on either end of each shaft, developing 40 h.p. The booms are skeleton steel frames with heavy sheaves at the outer ends and heavy steel blocks using ⅞-inch diameter cable. These cars have been tested to lift a load of 50 tons.



No. 4. Completed Structure, ready for traffic

Friction in Water Pipes

When water flows through any channel, or through pipes under pressure, it meets with resistances which retard its motion, and reduce its pressure. These resistances are called, technically, "friction." Particles of water move with great freedom among themselves, and, if observed when in rapid motion, they will be seen striking the pipe, rebounding and striking other particles of water, which, in time, rub against and obstruct other particles. The further away from the sides of the channel, which is the cause of this commotion, the less the disturbance, and the more rapid the flow of the water.

The greater the head, therefore, the faster the flow, the greater the commotion caused, and the greater the resistance created by friction. The larger the channel, or pipe, the less will this commotion penetrate the central part of the stream. It is to the fact that the channel is confined, and to the forward motion of the whole stream, that this movement of the particles of water among themselves, and the consequent resistance, is due, and so long as there is forward motion, this resistance must continue.

Areas of circles are, to each other, as the square of their diameters. It is usually considered that the doubling of the size of the pipe decreases the loss by friction at the same velocity of motion in the pipe, one-half. In other words, the loss by friction at equal velocities in different sized pipes, varies practically in the ratio of pipe surface or circumference, to cross section. Practically, when delivering the same number of gallons per minute the friction loss in two pipes of equal length, the diameter of one of which is twice that of the other, will be in the larger pipe one-thirtieth of that in the smaller, or the loss in the smaller will be thirty times as great as that in the larger.

This relation of volume, or number of gallons to be delivered per minute, should never be disregarded by the plumber who is ambitious to do effective work. Friction developed in different sized pipes should never be overlooked when calculating water supplies. In laying the pipes all bends and elbows should be avoided, where that is possible. The pipes should be as large as possible to use for the purpose, and the trend of their direction should be changed gradually. Sudden changes in direction destroy the velocity of the flow very rapidly, and, as a result, reduce the volume of the discharge. A reduction, or an increase, in the size of the pipe, caused by the screwing on of branch pipes, smaller or larger, also reduces the velocity, and makes the work of the plumber less effective.

At a recent meeting of the Winnipeg Board of Control, the Engineer of Construction, Mr. J. W. Astley, laid before the members a sample piece of pavement used in Buffalo, N.Y. The distinctive characteristic of this block is that there are broken stones mixed in the asphalt. It was decided to make a trial of this pavement on one or two portions of streets where the traffic is heavy. The Engineer of Construction submitted important suggestions in regard to pavement construction. It was recommended that the concrete foundation be increased from six to seven inches on all streets in the business part of the city. The deeper foundation would ensure greater efficiency in the patching of cuts. Mr. Astley pointed out that the deeper foundation would not mean much extra cost.

Concrete Road Construction

By Frank R. Charles, City Engineer, Richmond, Ind.

The city of Richmond, Ind., cannot claim to have a large amount of concrete roadways, but it laid some of the earliest street pavements of this construction. Our first roadway was laid in 1896, and now has nearly 14 years of life and usefulness to its credit, and is still continuing its service without having cost one cent for repairs. In truth this was a small beginning, and owing to the excellent character of its macadam streets, our city has been backward in constructing permanent pavements, but nevertheless this first concrete roadway has abundantly justified its existence, so that for the last eight or ten years the amount has been added to by a small amount annually. There was nothing especially remarkable about the construction of this first pavement, except that extreme care was used in all the processes, particularly the minor ones. The natural soil under the first pavement is gravel, so that no sub-base was required. The concrete was proportioned 1 : 2 : 5, deposited five inches thick after ramming with a top surface one inch thick, proportioned 1 to 2. It was cut into blocks about five feet square and the surface pitted with an ordinary lug roller.

In the subsequent work, various plans have been used. The principal variations consist in the material for aggregate, thickness of concrete, with and without a top surface, thickness of the latter, size of blocks, thickness of joints and material used therefor. One roadway was cut in blocks eight to ten feet square; another, 30 or 40 feet square; all joints between the blocks, both cross and longitudinally, are one inch wide and filled with paving pitch. The defect of this method consists in the chipping of the concrete edges at these joints, principally the longitudinal ones. Our experience seems to show the blocks should be as large as possible in order to reduce the number of joints, and that the joints should be as thin as can be made. On the other hand, we find that blocks ten to fifteen feet square are about as large as can be made without developing temperature cracks in our climate. These latter, however, apparently do not injure the pavement, beyond detracting from its appearance, as cracks that have existed for years show no enlarging, and the pavement up to and over the cracks is as solid as elsewhere. Possibly there have been such experiments, but I have no knowledge of them to ascertain what size of blocks are safe in different climates or places with range of temperature. Corrugating or grooving the surface is also objectionable for the same reasons as are the joints; the edges of the grooves afford an opportunity for the concrete to chip and spawl off by the action of horses' hoofs, etc. Also the grooves catch and collect the dirt, interfering with the cleanliness of the pavement and rendering it more difficult to sweep. Possibly the corrugations afford slightly better foothold for horses, but I think even here the advantage is exaggerated. We obtain a very good surface by using 1 part cement to 2 parts hard-grained coarse sand, screened through a No. 4 screen; trowel down to remove all holes, air spaces, etc., and "raise" with a cork or wood float, giving a rough gritty surface, on which horses can maintain their footing as securely as on a cement-filled brick, an asphalt, or wooden block pavement when damp.

For ordinary traffic pavement we find excellent results are secured by the use of five inches of 1 : 2 :-5 concrete, and a top surface 1½ inches thick, mixed 1 to 2. For automobile travel nothing could be more satisfactory. Of course, it is trite and unnecessary to say that care must be used in selecting good aggregate material, proportioning properly to reduce voids to a minimum, and securing good workmanship in all the operations of mixing, placing and finishing the work. I am a firm believer in "wet mix," for this, as well as for most other concrete work. Place this concrete on a well prepared foundation, using suitable straight edges and templates cut to the required crown of the street; tamp or jostle to make a compact mass, leaving the surface rough to provide attachment for the top layer; cut joints through the concrete every ten to fifteen feet, and fill with sand. Before the concrete begins to set, place thereon the top surface, composed of 1 part cement to 2 parts hard, coarse sand, trowel and float, cutting joints directly over those in the concrete, using a small radius "jointer" to leave as thin a joint as possible, and finally finish by means of a "float," leaving the surface as rough as possible. This gives a roadway very suitable for our use. For heavier traffic, six inches of concrete and 2-inch top surface is advantageous. We also have good results by making the pavement homogeneous—that is, without the top surface. Make the concrete somewhat richer in cement and quite wet. Tamp until free mortar flushes to the top, then finish with trowel and float. For this purpose the concrete should be free from large stones, as with a large stone at the surface, if one end becomes worn loose, a large leverage is afforded to tear the remainder of the stone from the concrete. As remarked before, the disadvantage of concrete is its lack of toughness, whereby exposed edges of joints and corrugations are prone to chip and wear off. For this reason joints ought to be reduced to a minimum, and especially longitudinal joints should be eliminated wherever possible. Another defect urged against concrete is its lack of elasticity. This contention does not seem to be well founded, as concrete is not the only non-elastic pavement. Brick on a concrete foundation and with a cement filler seems to be about as unyielding and non-elastic as any roadway could be. Of course, for horses some elasticity is desirable, but in view of the increasing numbers of motor vehicles, this quality is not so essential to so many users as formerly.

The present laws of our State, while passed avowedly in the interests of the asphalt paving industry, ought to bring about the increased use of concrete roadways. For example, plans must be made for a foundation suitable for any kind of "a modern city pavement," which foundation naturally will be concrete. Then the specifications must include, and bids be received for four different paving materials to go on top of this concrete foundation. After receipt of bids the property owners have the right to determine which one of the four shall be adopted, and since cheapness usually appeals to the average property owner, asphalt often wins the day, because with the same foundation specified for each pavement, the top surface of asphalt can be put on at less cost than brick. Here is the chance for concrete paving. Put down a foundation suitable for any kind of pavement, viz., five or six inches in depth of concrete, mixed, placed and jointed as above suggested; then before this concrete begins to set, place thereon the "paving material," consisting of the wearing surface 1½ or 2 inches thick, mixed one part cement and two parts sand, as before stated, and you will have a pavement that can compete with any other in price, will cost less in maintenance, and will give a cleanly, sanitary effect.

One of the most remarkable increases in building permits was that of Regina for last month. The report for February, 1910, showed a gain of no less than 930 per cent. over that of the corresponding month of 1909. The first two months of the current year also showed a large gain—800 per cent. in excess of January and February of 1909. At such a rate Regina bids fair to establish during the coming year a record unique even in the history of western Canada.

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*Paper read before the convention of the National Association of Cement Users.

Concrete Fireplaces and Chimneys

In the past few years concrete has been used for fireplaces and chimneys with varied success, the dry-tamped chimney block proving the last practical owing to its scaling off on the inside from the heat until the upper blocks were but a frail shell and the lower half of the chimney was filled with a solid mass of rubbish consisting of worthless cement. The many failures of concrete as a substitute for fire clay brick, are due to the fact that too much was expected of this one material.

Concrete varies according to the material from which it is made, and while concrete made of ordinary raw materials will crumble at a few hundred degrees of heat, other concrete made of other, yet ordinary materials, will resist four or five times as much heat without injury. We must learn, therefore, to make concrete according to its uses, which will necessitate classifying accordingly the same as wood. For example, we would not think of making furniture, such as chairs, of hemlock, nor do we think of making drawing boards of oak, yet both are wood. A cement and sand composition may be such as to admit a polish like marble, or it may be as gritty as a grindstone, and both be known as concrete.

A concrete to withstand continual heat of a high temperature, must be made to meet the requirements. With the object of discovering the best concrete for high temperature, I built a fireplace several years ago, using cement brick of various raw materials and recently made a careful examination of the work.

Brick made of one part (high burned Portland cement to four parts crushed furnace slag sand, and after seasoning dipped into a weak solution of soft soap, remained uninjured or discolored; in fact, after being washed they were as perfect as when the fireplace was built. The brick made as above but not dipped, were sound, but somewhat discolored, indicating that the soap dip prevented discoloration. Brick made of same cement and clear sand which had been previously heated to about 1,500 degrees, also remained intact when containing one part cement to five parts sand, but those made of one cement to three parts sand were badly cracked, all were discolored; those having been soap dipped were found in best condition.

All brick made of crushed sandstone, or limestone screenings were more or less injured, those with sand made of crushed gravel or granite held better than those of unheated sand, but when sprinkled with cold water they soon broke into many particles, the gravel and the granite quartz being affected about equally, as the soap dip did not protect either materials from discoloration.

The results indicated plainly that a porous concrete (containing less cement was more fireproof than a rich dense composition, while discoloration was less on the more dense (richer) composition. It also indicated that a wet mix was much superior to the dry tamp brick for all materials.

Summing up the materials, I derive the following points to be used in making concrete for a fireplace or chimney lining:

Never use gravel or crushed granite or marble; while hard blue limestone may be used for only moderate heating places, after same has been subjected to a high temperature before mixing with the cement.

If possible, use only crushed furnace slag for sand, and if same is unobtainable then use a sharp silica sand first heated either in a furnace or large outdoor fire. Always allow the heated material to become cold before using for concrete.

Always make the concrete sufficiently wet to make a stiff mortar, while thin enough to pour does not add to the quality. The concrete may be dipped or coated with a solution of one part soap dissolved in 20 parts water; while this does not add to the fireproof qualities it does much to prevent discoloration.

Never make the concrete too rich with cement, as a mixture of one cement to four or five parts sand is superior to a richer mixture in resisting heat.

Always use a high-burned Portland cement, preferably one made from by-products of furnaces. All high-burned Portland cements are acceptable.

Vancouver's Building By-law.

The new civic building by-law at Vancouver, B.C., has raised the standard of construction for apartment houses. According to the revised regulations, all three storey apartment houses or tenements having more than three suites of five rooms each on a floor must be constructed of brick or other incombustible material. All two storey apartment houses having more than four suites of five rooms on a floor must also be of this type of construction. All apartment houses not of fireproof construction and having more than six suites on each floor shall be provided with interior brick fire walls.

The flooring of apartment houses coming under the above classifications must be of double construction and lined with asbestos paper, and all the partitions between the apartments, corridors, etc., must be of heavy construction. No suites except those occupied by the janitor will be allowed in the basement. In blocks where the ground floor is used for stores and the upper flat for apartments, provision is demanded even in two storey buildings for double flooring.

Other clauses of the amended by-law cover the question of ventilation, prohibiting the use of inside light wells, as well as the plan of ventilating one room through another. All light courts must represent at least 10 per cent. of the area of the building except on corner properties, where the court must have five per cent. of the area on the side not abutting on the street or lane.

Canada Cement Company Doing Well.

The balance sheet which has just been issued by the Canada Cement Company, Limited, furnishes convincing evidence of the company's strong financial position. Several features of the statement are especially striking and significant. The accounts receivable, bills receivable and deposits on tenders are in excess of accounts payable and bills payable by over $90,000. The company has cash in hand of $552,265, and the liquid assets amount to $2,512,667, or more than half the issued bonds. This is a particularly striking feature of the report. Another feature that cannot fail to evoke favorable comment is that despite the fact that during the broken period which the report covers, the company was in its organization period, without a general manager and with everything in a transition stage, the bond interest for the quarter ended December 31, was earned more than twice over. That in such a short time and under exceptional difficulties the company has been able to accomplish what it has, can only be accepted as a promising augury. Up to date the properties of the following companies have been acquired: Vulcan Cement Company, Montreal, Que.; Lehigh Cement Company, Belleville, Ont.; Canadian Cement Company, Marlbank, Ont.; Canadian Cement Company, Port Colborne, Ont.; Belleville Cement Company, Belleville, Ont.; International Portland Cement Company, Hull, Que.; Lakefield Cement Company, Lakefield, Ont.; Lakefield Cement Company, Montreal, Que.; Owen Sound Cement Company, Shallow Lake, Ont.; Alberta Cement Company, Calgary, Alta.

Trade News from Montreal

Building Statistics Piling up—Supply Dealers Helped by Early Opening of Navigation

Montreal Office of the "Contract Record."

March 28th, 1910.

Excellent building weather prevails now in the Montreal district and the building season is opening up in earnest. Building Inspector Chausse's office is being kept busy and the March building statistics should show a marked increase over the same month in the previous year.

A notable feature are the permits taken out for construction of medium sized residences in the outlying districts; and from present indications this work will constitute an important field for the general contractor.

The anticipated early opening of navigation is having a stimulating effect upon the various building supply trades at the present time. Navigation is partly open now between Quebec City and the Lower Gulf ports, and dealers are making preparation for the reception of their supplies at an earlier date than usual.

Sewer work should open up earlier than is customary, since iron pipe reaches Montreal chiefly by water shipments, and these are usually held up until well on in May. The early departure of the snow from Montreal also allows for the commencement of sewer and waterworks contracts from this time forward, and the city's engineers, it is understood, have extensive work planned for the coming year. Among other projects, a large portion of the big Sherbrooke street intercepting sewer remains to be completed.

The work of constructing the foundation piers for the new seven storey fireproof building which the St. Lawrence Sugar Refining Company, Limited, will erect this season, is being proceeded with by the general contractor, Mr. E. G. M. Cape.

In excavating for the foundation piers the contractor encountered a steam pipe installed some years ago for the purpose of thawing ice formations in the rivers, in front of the company's works. This was never made use of and its presence was never figured on in laying out the site. It extends the entire length of the site and then drops to a depth of forty feet. At this latter point the pipe is boxed in and the contractor had to provide a method of filling in this hole, since its position was identical with that of one of the piers. To do this, bagged concrete was placed in position until above water and then ordinary methods were adopted. For the remaining piers, concrete reinforced with steel bars is being used. This method is employed to distribute the strain over the three columns, placed in a row; the centre pillar comes directly over the old steam pipe and the ground in this vicinity is not considered firm enough to stand an individual strain. The new building will have seven storeys and basement, and is of skeleton steel type, with reinforced concrete flooring. It is expected that this building will be finished about the middle of the summer.

New St. Catherine Street Bridge

Satisfactory progress is being made with the construction of the new St. Catherine street bridge, over the C.P.R. tracks in the eastern part of the city. The contract for the removal of the old bridge and masonery piers was let some time ago to Mr. E. G. M. Cape, general contractor, 40 Hospital street. The plans for the new bridge provide for the erection of new steel girders; while the Canadian Pacific Railway Company are allowed a larger space for their tracks. The floor of the bridge is being finished with reinforced concrete construction and will provide accommodation for the double tracks of the Montreal Street Railway Company, a roadway, and a granolithic sidewalk on either side. The contractor expects to have the bridge completed and ready for traffic in the early part of the season.

Structural Steel Company Busy at Longue Point

The Structural Steel Company, Limited, of Montreal, have recently moved into new and commodious offices adjoining their Longue Point plant. Mr. Brower, manager, states that they are finding the present season far ahead of the same period last year. Enquiries are more numerous and the outlook for new business is very encouraging. The Structural Steel Company is one of the newest of the large structural companies, but since organization they have completed numerous important contracts, and, in spite of the dull season in the building trade during the winter months, they have had sufficient work on hand to enable them to operate their plant for practically full time. The structural steel work for the Legislative Buildings at Regina, Sask., was recently completed and final shipments are now being made of the steel required for the Parliament Buildings at Edmonton, Alta. The steel frame work for the Murphy building and Ogilvy departmental store were also fabricated by the Structural Steel Company.

Among the contracts which the company have under way at present are the Beardmore building, the National Breweries extension, the General Hospital and the construction of three large dump scows for the Canadian General Development Company. The main buildings for the Mines Power Company, Limited, at Cobalt, Ont., were recently finished by the Structural Steel Company, and they have now under way the erection of several new buildings for the Canadian Iron & Foundry Company, Limited, at Three Rivers, Que. They are also fabricating pulp conveyors of a new design, for the Brontton Pulp & Paper Company, of East Angus, Que.

New Firm of Concrete Engineers

Under the firm name of Messrs. Jago & Harris, a partnership has just been formed between Mr. J. F. Jago, a member of the firm of Messrs. J. F. Jago & Company, reinforced concrete contractors, Coristine Building, and Mr. R. R. Carr-Harris, C.E., of Toronto.

The new firm have opened offices in the Confederation Life Building, Toronto, and will carry on the business of reinforced concrete contractors and engineers.

Mr. J. F. Jago is well known in Montreal, where his firm has been identified with several of the largest reinforced concrete constructions in the city, notably the new Wilder Building. The other member of the new firm is Mr. R. R. Carr-Harris, C.E., a graduate of the Royal Military College, Kingston, and also of Queen's University in civil engineering. For several years he was engaged in the west with the construction department of the C.P.R. Latterly he has been in charge of railway construction work for the Chinese Government.

Montreal Contractors at Three Rivers

The Canadian Iron & Foundry Company, Limited, Three Rivers, Que., have under construction four new shop buildings. These are respectively, 160 feet by 60 feet; 240 feet by 50 feet; 160 feet by 50 feet, and 60 feet by 50 feet. Mr. E. G. M Cape is the general contractor and has already completed a portion of the work. The foundation of these buildings are reinforced concrete and the buildings themselves are being finished with steel and corrugated iron. Several crane runners are also being installed. It is anticipated that these buildings will be finished in the early part of the summer. The Structural Steel Company, of Longue Point, Que., have the contract for the steel fabrication and erection.

During the past week the general contractor, Mr. E. G. M. Cape, made a start on the foundation work for the new "Earl Grey" fireproof school building for the Board of Protestant School Commissioners, of Montreal. The plans for this building were drawn by Mr. A. F. Dunlop.

From the Federal Capital

Correspondence of the Contract Record

Ottawa, Ont., March 28, 1910.

Owing to the building boom in this city, the local brick yards are unable to meet the demand for this class of material, and, as a consequence, building operations in the city are suffering just now from the shortage, very few of the large builders having more than a limited supply of brick on hand. Reserve stocks have all been used up and several of the big yards are running day and night in a futile endeavor to keep up with the abnormal demand. The shortage of brick is felt most in the outlying districts of the city, where the erection of brick residences is going ahead at a tremendous rate. A great deal of brick is being brought into the city from outside points, notably Casselman, where there is an extensive plant. Brick manufacturers state that they have never before seen anything like the present boom in the whole of their experience. Apart from brick, there is little change to report in building materials. Crushed stone has gone up 15 cents a ton, and cement is selling from $1.70 to $1.90, according to quantity.

A great number of building permits have been taken out at the City Hall during the last three weeks, and the outlook for the building and allied trades is for an exceedingly busy season.

New Building By-law

The Board of Control will hold a special meeting next week to deal with the new building by-law. The recommendations of the medical committee, which has been considering what provisions should be made to assure sanitary conditions in houses, will bring in its report, and the board hopes finally to dispose of the measure, which has been before various civic bodies on and off for over two years.

A Word from Regina, Sask.

2,500 additional Mechanics and Laborers Required in the Western Capital — Trade Activity Typical of Entire Section of Country

Regina, Sask., March 24th, 1910.

That Regina, in common with other cities in the West, will shortly be face to face with a labor famine is a fact that admits of no argument. It is estimated by contractors here that 2,500 additional men will be required by the middle of April. Of these, 1,000 will be mechanics, principally carpenters, also bricklayers, stone masons and plasterers. The balance will be unskilled labor. That there is reasonable ground for the estimate submitted by the contractors is verified by the following figures of buildings which have already been definitely arranged for, or tenders for the erection of which have been called at the present time:

Strathcona school, $75,000; Shaw apartment block, $25,000; International Harvester warehouse, $50,000; Campbell Bros. & Wilson warehouse, $30,000; City Hospital, $150,000; Grey Nun's Hospital, $125,000; McAra & Mowat block, $35,000; Woods' building, $35,000; Glasgow House, departmental store, $100,000; Crapper building, $20,000; Convent "Our Lady of Missions," $30,000; J. I. Case warehouse, $75,000; City Market, $18,000; Parliament Buildings (progress estimates), $750,000; 150 residences (average $3,000), $150,000; Exhibition buildings, $33,000; Armstrong, Smyth & Dowswell, $17,000; Total, $2,018,000.

This list, though large in itself, does not by any means cover the whole of the work that will be undertaken this spring. The city has approved of estimates and is submitting a by-law for the laying of additional pavements and sidewalks to the amount of $125,300. A subway will be built at Albert street at an estimated cost, to be divided between the city and the Canadian Pacific Railway Company, of $128,000. A by-law will be submitted to the people asking for the approval of a charter for a street railway company, and the charter calls for seven miles of this being built this year. The Canadian Pacific Railway Company are calling for tenders for new freight sheds. The city is considering the installation of a municipal gas plant.

In addition to the above, other buildings for which arrangements are now being made might be mentioned in the following: Imperial Bank, bank building; Ottawa Bank, bank building; Isolation Hospital; addition to power house; Ackerman warehouse, Catholic school, Whitmore Bros., building block, and many others. It is safe to say that $4,000,000 will be expended in building operations in this city this year, should the labor to carry it out be forthcoming.

The following is the estimated scale of wages that will be paid in Regina this year: Bricklayers and masons, 55 to 65 cents per hour for a day of 9 hours; plasterers, 55 to 65 cents per day for a day of 10 hours; carpenters, 35 to 40 cents per hour for a day of 10 hours; painters, 30 to 40 cents per hour for a day of 10 hours; steamfitters and plumbers, 50 to 60 cents per hour; laborers, 20 to 30 cents per hour for a day of 10 hours.

Clean Cement from Walls or Floors

Cement is a silicate of lime, and as such is far too hard to remove by ordinary scouring with sharp sand or other gritty material. Consequently after a tiled floor or wall has been grouted and it is necessary to remove the superfluous cement from the surface, the wall or floor is washed with muriatic acid. This acid is a volatile gas dissolved in water. It attacks the cement and forms a soluble lime salt which can be readily removed by washing with ordinary water. Muriatic acid, however, casts off fumes which in physical laboratories, fine dynamo rooms or other places containing delicate metal instruments such as galvanometers, ohmmeters, etc., injures the metal by corrosion.

In these places dilute sulphuric acid may be used. It is not volatile and consequently does not injure metal work. However, it does not form with the cement a soluble lime salt, but a phosphate of lime, which is the same as plaster of paris. This is much softer than the original Portland cement, so that by using dilute sulphuric acid and scouring hard with sand it is in most cases possible to clean the tile floor or wall.

The best medium for dissolving cement is citric acid. This is a clear solid substance which can be bought from any druggist. It dissolves readily in water and will attack set Portland cement quite as well as will muriatic acid, because it forms with the cement a perfectly soluble nitrate of lime. Its only objectionable feature is its cost, which is several times greater than that of muriatic acid. Ordinary lemon juice is a solution of citric acid, but as the latter is made in a wholesale way in the tropics, it is cheaper than lemon juice.

A cheaper substitute for citric acid is tartaric acid, much used in making lemonade. This also can be obtained at any drug store. It forms with the cement a tartrate of lime. It is not as soluble as citrate of lime, and consequently its use in cleaning tiled floors has disadvantages similar to those met with in using sulphuric acid. The tartrate of lime is however, somewhat easier to remove than sulphate of lime. Consequently, although a tile surface which has been treated with tartaric acid requires considerable sand scouring to remove the cement, the operation is nevertheless easier than when sulphuric acid has been used.

Muriatic acid is the most usual and most feasible medium for cleaning cement from tile floors. When, however, its fumes are likely to corrode delicate metal instruments, either sulphuric, citric or tartaric acid must be used in its place.

The Builders' Exchanges and Their Work

Progressiveness at Windsor, Ont.—The History, Personnel and Aims of the Builders and Contractors' Association of Essex

The Builders and Contractors' Association of Essex, located at Windsor, Ont., is probably the youngest organization of its kind in Canada, it having been formed only in January, 1908. Previous to that time there was no association for master builders in the city except for the master house painters and master carpenters. These two branches of the trade, being alive to the benefits of organization, got together and succeeded in forming a combined association, starting with a membership of 38. At present the Association includes within its ranks nine-tenths of the local contracting fraternity. Nobody is eligible for membership in this Association unless actually engaged in active building work. Rightly or wrongly, the Association takes a strong stand against admitting supply men to membership, and adduces this as one of the chief reasons for not affiliating with the builders' exchanges

The first president of this Association was Mr. M. A. Bryan, of the plumbing firm of Penington & Bryan. Mr. Geo. H. Thompson, of Thompson Bros., masonry contractors, was the first vice-president. When the Association was formed Mr. G. W. Freeman was elected secretary and Mr. E. Jacques, treasurer. In the second year Messrs. Geo. H. Thompson and L. Burton West (of the Barton Netting Company), were elected president and vice-president respectively.

Mr. L. Burton West,
President Builders and Contractors' Association of Essex.

The officers serving for the current year are as follows: President, L. Burton West; Vice-President, U. F. Doumouchelle; Recording Secretary, Geo. W. Freeman; Financial Secretary, G. C. Haugh; Treasurer, Robt. Parker. The executive board is made up of the above officers with the addition of Messrs. Robt. Paddon and A. A. Little. Regular meetings of the Association are held on the first and third Tuesdays of the month. The last regular meeting witnessed the close of a series of competitions in card games, for which three prizes were given. At these entertainments light refreshments were served. During the summer, the members meet on Saturday afternoon and engage at quoits, the losing side afterwards standing a dinner. Mr. Geo. W. Freeman is also chairman of the entertainment committee, which is doing splendid work in maintaining the interest of the members.

Vice-President U. F. Dumouchelle.

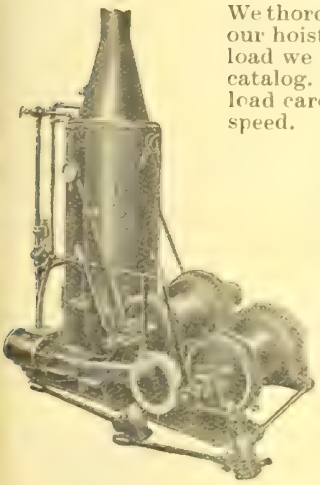
The yearly or monthly membership dues are fixed by the Board of Trustees at the annual meeting and are payable monthly in advance. The admission fee is $10.

A commendable work has been started by the Dennis Wire & Iron Company, Limited, of London, Ont., who have inaugurated evening classes under expert direction with a view to improving the technical attainments of their employees. The Dennis Company employ about 100 men. Of these, about 30 have already enrolled themselves for the work. Mr. E. R. Dennis, the manager of the concern, makes a special hobby of technical education, and has worked hard in the past with the object of interesting the authorities in the establishment of trade schools. Mr. Dennis, however, aparently tired of these slow moving, slow thinking gentlemen, and determined to act on his own account. The example that he has set is one well worthy of emulation. The Dennis school will probably be the first of its kind in Canada .

The rumor that Senator Edwards, of Ottawa, will be the new president of the big cement merger is practically confirmed. The officers elected immediately after the incorporation of the company held office only during the period of organization. It is presumed that Sir Sanford Fleming will be re-elected honorary president.

Mr. John Duncan, a well known contractor, of Windsor, Ont., died suddenly from heart failure last week The deceased gentleman was 57 years of age and had lived in Windsor all his life.

The Guaranteed Hoisting Engine



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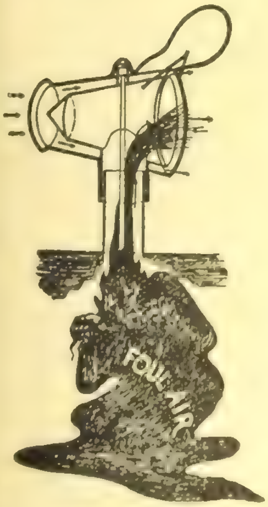

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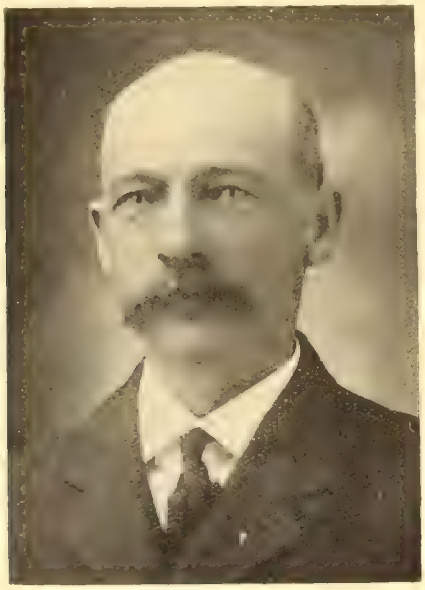
Canadian City Engineers

James Hutcheon, Guelph, Ont.

Mr. James Hutcheon, City Engineer of Guelph, Ont., is a native of Nassagaweya, Halton County, Ont. He graduated from the School of Practical Science, Toronto, in 1890. Subsequently he qualified for the duties of an Ontario land surveyor, and took up survey work in New Ontario. For some time he practised under the direction of the late Mr. W. R. Burke, of Ingersoll. Later on he joined the staff of Mr. C. H. Keefer, and obtained much useful engineering experience, notably in bridge work. In 1893 he accepted the position of city engineer of Guelph, retaining the post until May, 1906, when he resigned in order to take up private work. For the better part of three years Mr. Hutcheon was engaged upon government surveys in New Ontario, along the line of the National Transcontinental Railway. In the spring of 1909, much to the satisfaction of the people of Guelph, he resumed his former connection with the city and again took up the duties of city engineer.



James Hutcheon, City Engineer of Guelph, Ont.

While there is some little tendency on the part of the larger cities to regard Guelph as being remote from the excitement and progressiveness of other places, considerable strides have been made at the Royal City during the last decade. Under Mr. Hutcheon's regime many miles of cement walks have been laid, several fine bridges erected and a sewerage system installed. Many serious difficulties were involved in the last-named undertaking; nevertheless the work was carried out successfully, and it is generally admitted that Mr. Hutcheon has given to Guelph an admirable system of sewers.

Mr. Hutcheon is loyal to Guelph and enthusiastic over his work in that city. He is still a comparatively young man and doubtless will have an opportunity of continuing his faithful and efficient service at Guelph for many years. Perhaps this is not exactly what Mr. Hutcheon would wish for. But one never knows. Certainly he is very enthusiastic about Guelph.

Personal News and Notes

Mr. Angus Smith, city engineer of Regina, Sask., has been appointed city engineer of Victoria, B.C.

At Winnipeg, Man., the total for building permits stands at over $2,000,000, placing the present season one month in advance of the record year of 1907.

One of Montreal's oldest architects passed away last week in the person of Mr. F. N. Boxer. Mr. Boxer was in his 88th year and came to Canada from England when 20 years of age.

At a meeting of the Manitoba Good Roads Association held in Winnipeg last week, officers were elected as follows: President, S. R. Henderson, reeve of Kildonan; Vice-President, Controller Waugh, Winnipeg; Secretary-Treasurer, G. F. Bentley, Winnipeg.

Vancouver, B.C., this year is going ahead by leaps and bounds. By March 14, the building total for the month was already $50,000 in advance of the figures for March, 1909, the respective amounts standing at $850,000 and $800,000.

Mr. R. E. Speakman, city engineer of Brandon, Man , who, it was announced recently, had resigned his position in order to take up similar work at Victoria, B.C., has revoked his decision and will remain at Brandon for a period of at least two years, at an annual salary of $3,500.

It is with much regret that we have to report the death of Mr. Gillmor Brown, assistant engineer, Public Works Department, Ottawa, who died of heart failure at tht Royal Victoria Hospital, Montreal, last week. A photo and biographical sketch of the late Mr. Brown were published in our issue of March 2nd.

Mr. F. J. Wilson, of the city engineer's department at Toronto, Ont., has been appointed city engineer of Moose Jaw, Sask., and left last week to take up his new duties. Mr. Wilson is a graduate of Toronto University and has had considerable experience in his profession. During the past year he has been serving the city of Toronto as assistant on the waterworks tunnel, the trunk sewer and the high pressure fire system.

"The Hardwood Flooring Company," recently organized to carry on an exclusively flooring business in Montreal and vicinity, have taken over the agency for J R. Eaton & Sons, Orillia, Ont., manufacturers of "Empire" brand hardwood flooring. Mr. C. A. Spencer, who has been acting as J. R. Eaton & Sons' agent at Montreal, is interested in the new company, whose offices are at 55 St. Francois Xavier street, Montreal.

One of the most progressive builders' exchanges in Canada, if not on the continent, is the Winnipeg organization, the membership of which has increased from 40 to 50 a few years ago, to a present enrolment of over 400. During the past month, the entire suite of offices and rooms has been renovated and decorated, and the Exchange now offers all the comforts of club membership. Mr. J. H. Buxton is the energetic secretary.

The Ontario Sewer Pipe Company, Limited, Mimico, Ont., have sent us a copy of their 1910 catalogue in the form of a handsome leather pocketbook, which contains a great deal of useful information concerning the various lines manufactured by the company and providing ample space for figuring. The Ontario Sewer Pipe Company, Limited, have been manufacturing sewer pipe in Mimico for twenty years, and have strong grounds for their claims to excellence in this article owing to the fact that it is their sole line of manufacture.

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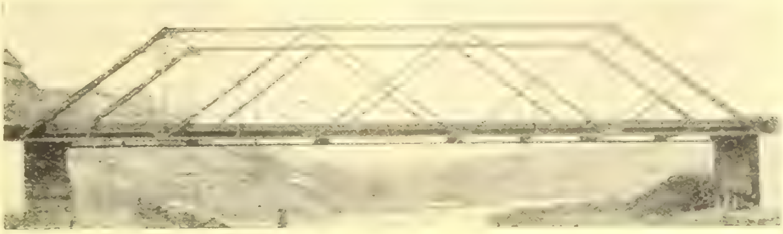

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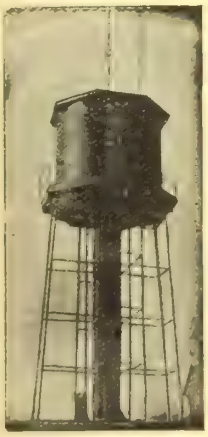

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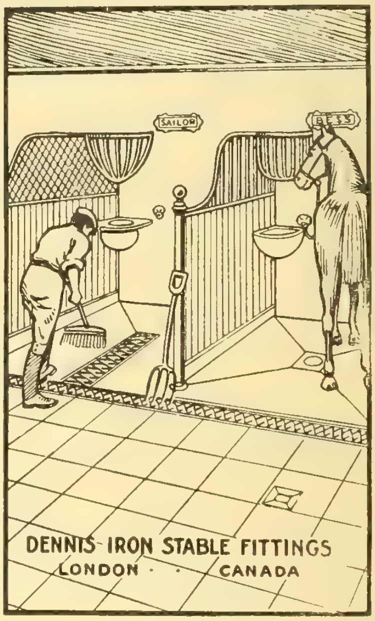

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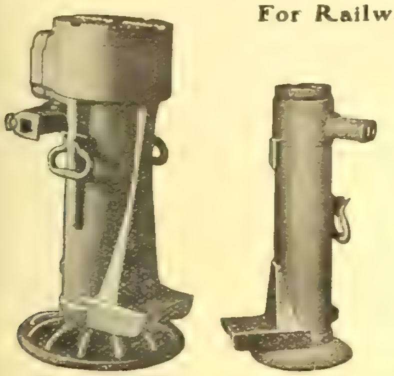

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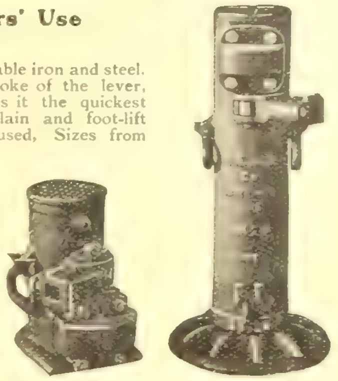

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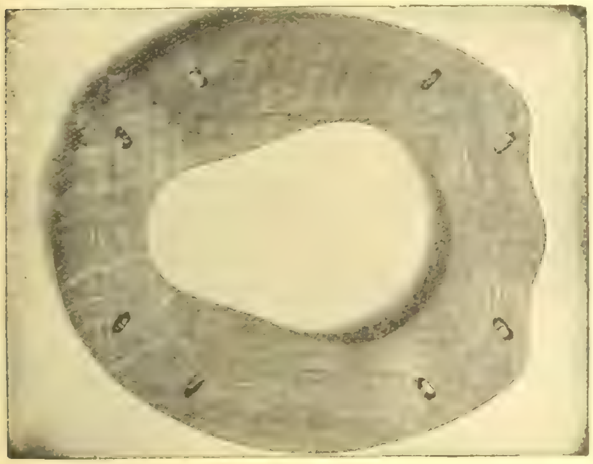

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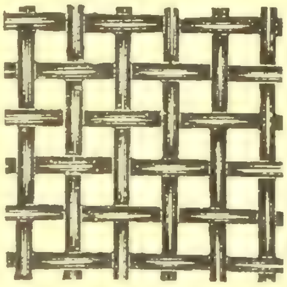

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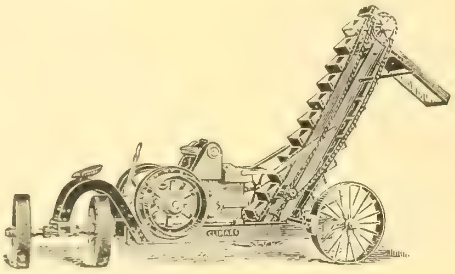

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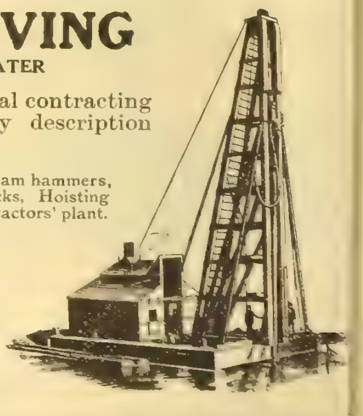

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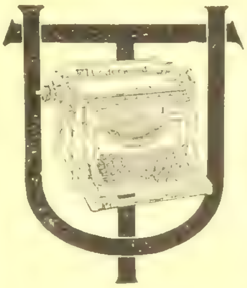

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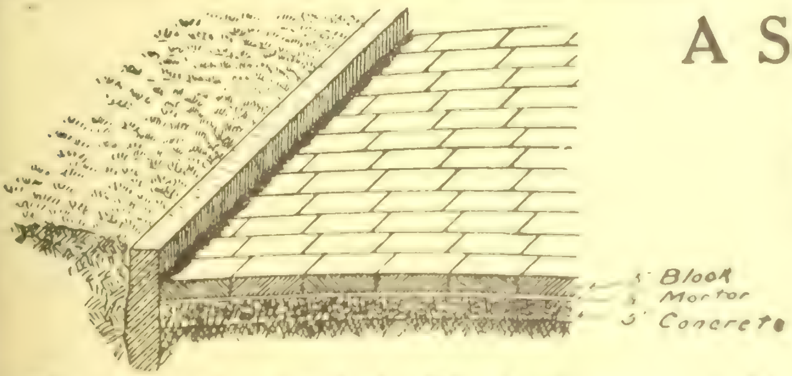

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Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, or foundation work	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D,D.
10 to 25 united inches	$4.25	$ 6,25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i,	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	.,..	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex. and 3-16-inch round, 35 cents per square foot up.

Floor Tile—½-inch square 45 cents.

Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 25 cents per square foot.

Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.

Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.

Matt—Dull finish colors, firsts 50 cents.

Capping Coves and corners, from 3 cents to 20 cents each.

Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.

O. G, Cap, 6 x 1½ inches, 10 cents each.

Cove base, 6 x 3 inches, 17 cents each.

Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.

Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.

White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.

White glass, installed, 6 x 3 inches, 28 cents.

White glass, installed, 6 x 2 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

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Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,

Flatway stop and stop and waste cocks, 70 per cent.; roundway,. 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Furnaces 45 per cent.; registers 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.; other specials, 40 per cent.

Boilers—Galvanized Iron Range,

30-gallon, standard, $4.75; extra heavy, $7.00.

CastIron Sinks.

16 x 24, $1.00; 18 x 30. $1.15; 18 x 36, $1.95.

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Size per 100 ft.	Black.		Galvanized.
¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 27½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

7 and 8-inch pipe, 40 per cent.

Light pipe 60 and 10 per cent.; fittings, 70, 50 and 10 per cent.

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Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $14 to $15 per toise.

Free stone delivered, $14 to $15 per toise.

Brown coursing stone, delivered, $3.25 to $3,50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.25 to $1.30 per ton.

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Campbell & [illegible], [illegible], Ont., wholesale [illegible], are [illegible] succeeded by Campbell & Johnson.

The [illegible] Company, Limited, plumbers, [illegible], are stated to have been succeeded by [illegible]son.

The Manitoba Gazette gives notice of the incorporation of the following companies: A. Snyder & Company, Limited, to take over the brick manufacturing business of A. Synder & Company, at Portage la Prairie and vicinity. Head office, Portage la Prairie. Capital, [illegible]. The Harper Construction Company, $50,000 capital; head office, Winnipeg. The directors are W. A. Harper, W. R. Mulock, E. [illegible], F. H. [illegible] and J. W. [illegible] Armstrong. The Corona Lumber Company, Limited, capital, [illegible]; head office, Winnipeg; the directors are W. Manahan, [illegible] and W. [illegible].

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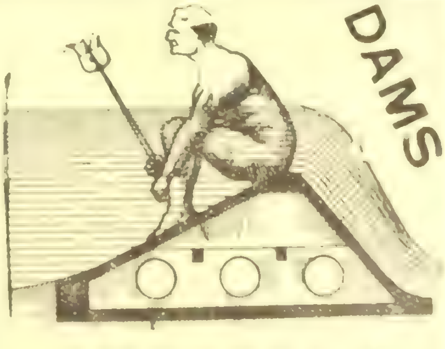

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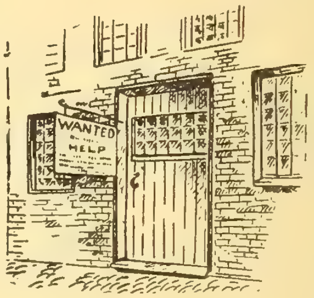

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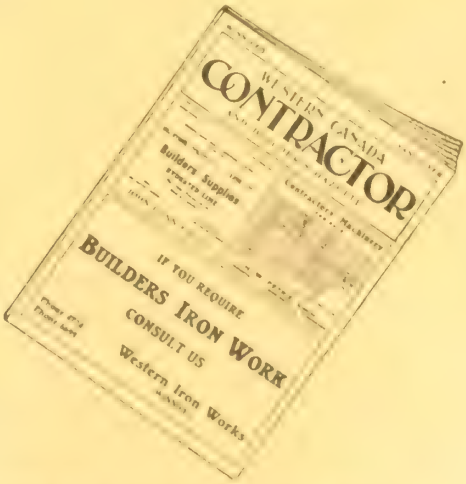

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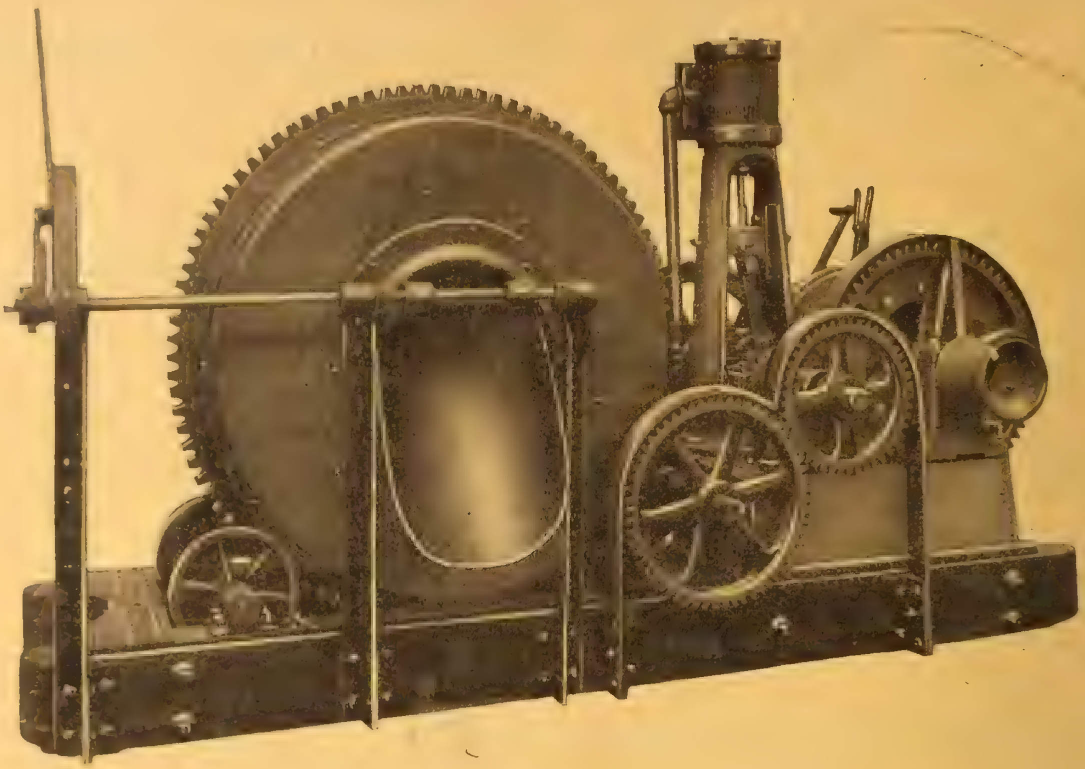

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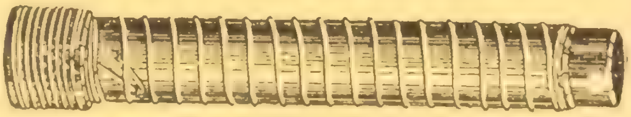

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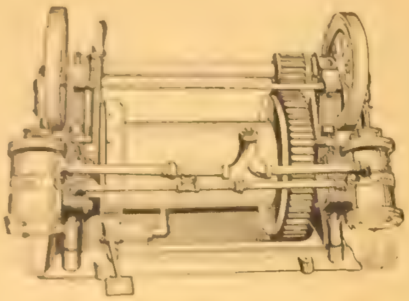

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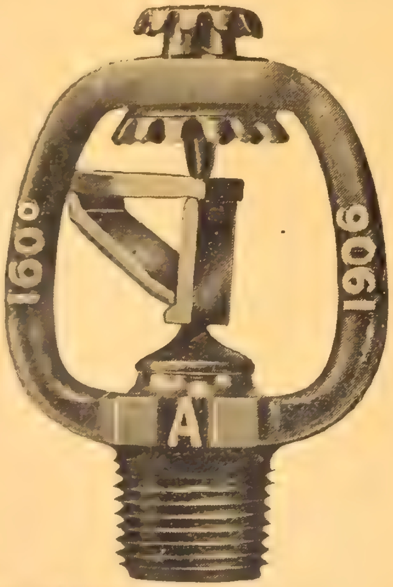

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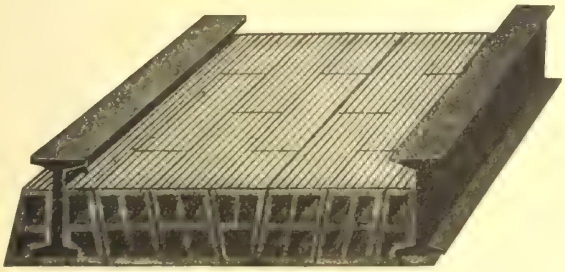
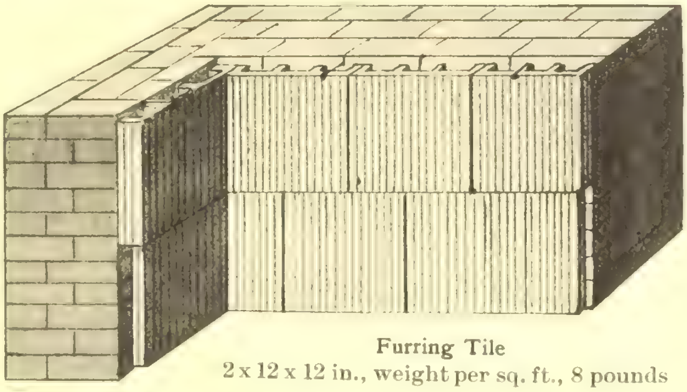


Perspective of Typical Arch



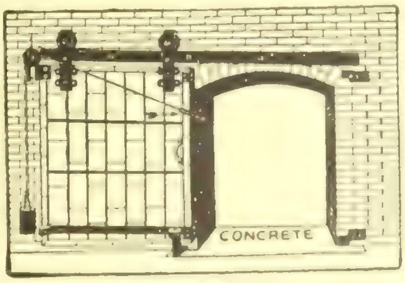
Furring Tile
2 x 12 x 12 in., weight per sq. ft., 8 pounds

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO
Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

What Labelled Fireproof Doors Mean to the Architect

The Fire Underwriters give a rating on any kind of Fireproof Doors, but that rating varies. A door that is near their requirement means but 50% of what should be given. **Only Labelled Fireproof Doors** bring the maximum reduction. These are the only Doors they are sure of.



Specify **Ormsby "Underwriters"** for the saving and safety of your clients.

A. B. ORMSBY, Limited

Experts in Fireproof Windows and Doors

Factories: Cor. Queen & George Sts. Toronto
677 St Notre Dame Ave W., Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Dredging, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.

Limited

Hagersville - Ont.

Paints and Varnishes Page
Cabot, Samuel [illegible]
[illegible]
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Inglis Co., John
Mussens Limited 34
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Waterous Engine Works Co.
Plaster
[illegible] Mfg. Co. 22
[illegible] & Co. [illegible]
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Metallic Roofing Co. [illegible]
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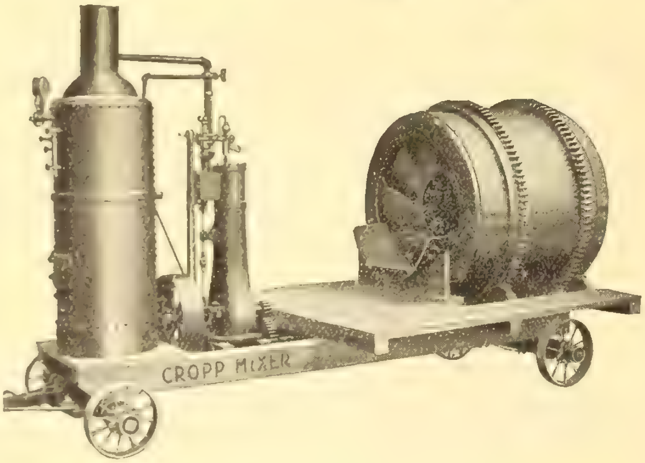
Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

We are bringing out a small Mixer number "O" which holds a One, Two and Four mix. This Mixer is very light and portable—just the thing for small Contractors.

Our Prices Will Interest You

The only Mixer that will not spill when overcharged

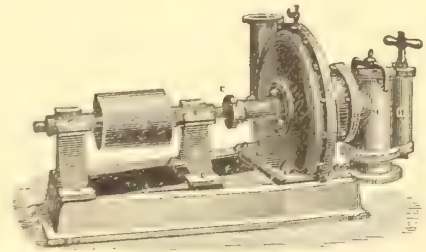
Cropp Concrete Machinery Co., 84 Lasalle Street,
Chicago, Ill., U. S. A.

M. Beatty & Sons, Limited

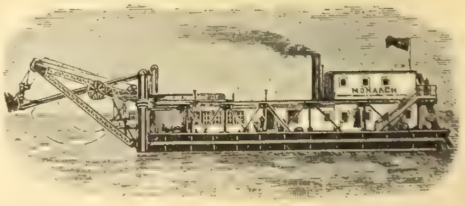
Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

Steel Dump and Deck Scows



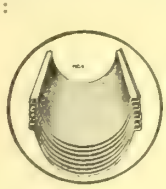
Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



Read why PEDLAR NESTABLE CULVERT

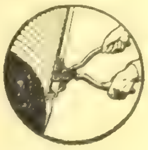
saves farmers money lowers taxes—betters roads

THESE culverts of mine are a great thing for the farming world. They not only make good roads possible, but they serve the farmer in many other ways. And they are so simply laid. They come nested like this:



This compactness saves freight and makes it easy to handle them. You put the sections together like this:

Then you clamp the flanges together like this:



And you've got a piping that will outlast anything of the kind there is. Better get the book and sample and study it.

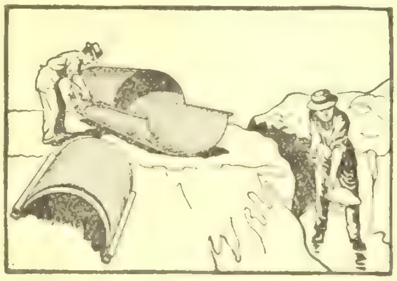
G. H. Pedlar

GET your township reeve or warden to study Pedlar Culverts. Send for the Free Book and show him why this Culvert surpasses for all ditch drainage, for restraining small streams, for every use that any culvert can serve. You will profit through lowered taxes, better roads and abolished washouts. Send for the book and interest your township's officials. You will benefit by what they will learn.

For a very moderate cost you can instal a perfect sewage-disposal system on your farm, using a suitably-sized Pedlar Culvert. You can realize the full value of the liquid manure your animals produce by draining your stable floors with Pedlar Culvert—and that highly valuable manure is usually wasted on farms. Pedlar Culvert makes it easy to water your cattle in winter. And there are a score of other uses for it on the farm.

Nothing vies with Pedlar Culvert as a well-curbing or a cistern lining. The thick galvanizing absolutely protects the metal of these Culverts from rust or corrosion, and the metal itself protects the water supply from contamination. For draining swampy spots around the farm, or for irrigation ditches and under-drains Pedlar Culverts far excel tile or cement piping, are much less costly, much easier to instal and infinitely more durable.

Pedlar Culvert is made in every standard size from 8 to 72 inches diameter, of Special Billet Iron of the the best quality, in extra heavy gauge. This Billet Iron is curved into semi-cylinders [illegible] half-cylinders are then corrugated by a [illegible] square inch. After being corrugated, the whole surface and each edge is heavily galvanized and made positively rust-proof.



A few hours' work—no special skill needed—and an indestructible culvert is in place ready for use.

PEDLAR CULVERT

is made in Nestable Sections from the Best Billet Iron, heavily galvanized and deeply corrugated.

It is the simplest kind of work to put these half-sections of Pedlar Culvert together permanently. One half-cylinder is placed on another, and the flange-rib on each side is rigidly compressed flat by the huge pressure exerted by a simple but effective tool. No bolts, no rivets, no makeshifts—but a triple-thick locking rib-flange that gives Pedlar Culvert immense strength. Thus it will stand crushing strains that would destroy any other piping.

This peculiar flat-flange, triple-thick rib makes the most perfect joint possible—nearly as good as if it were welded. Yet it allows for expansion and contraction under heat or cold. Thus a Pedlar Culvert will not spring nor split even though frozen solidly full of ice. Also the triple rib flange principle makes it possible to break joints in putting this Culvert together, something you cannot do with any other culvert or with cement piping or tile.

Pedlar Culverts are the most portable, as well as the most durable of any piping for any purpose. [illegible] great many linear feet of culvert occupy but few cubic feet of car or wagon space. This economizes freight and carriage costs, and makes it easy to transport this Culvert even in rough country. You should get the free book and sample culvert that makes the [illegible] possible needs when you write for the book, and let us quote prices.

HALIFAX
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ST. JOHN, N.B.
42-46 Prince William St.

QUEBEC
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MONTREAL
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OTTAWA
423 Sussex St.

TORONTO
111-113 Bay St.

LONDON
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WE WANT AGENTS IN SOME LOCALITIES
WRITE FOR DETAILS
MENTION THIS PAPER.

Send Now For Free Book

BOOKLET NO

And Sample Culvert

Address Nearest Warehouse of

THE PEDLAR PEOPLE
OF OSHAWA, CANADA

(Largest Sheet Metal Manufactory in the British Empire)

The Pedlar People of Oshawa
Ontario, Canada

include in the output of their immense factory the [illegible]

Pedlar Nestable Culvert, Oshawa Steel Shingles, Steel Roofing, Corrugated Iron, Metal [illegible], Skylights, Conductor Pipe, [illegible], Art Steel Ceilings, Art Steel Siding, Eave Troughs, Prepared Roofing, Metal Doors, Metal Lath, Ventilators, etc.

"I cannot doubt but that the manner in which the defendant has offered its goods to the public, advertised them —the similarity of the labels; similarity of combination in catalogue, the use of the word 'STANDARD,' were fitted to deceive the public, and are proved, in some instances to have deceived the public. Nor can I doubt that such deception was the object kept in view by the defendants' manager." — Extract from Hon. Mr. Justice Archibald's judgment in recent suit of the Standard Sanitary Mfg. Co., Pittsburg, Pa., against the Standard Ideal Co., Port Hope, Ont.

In almost all lines of manufacture there is some recognized leader, some brand that dominates the field because of its proven superiority. In their anxiety to imitate us in every particular, the defendants in the above action have attested that in Porcelain Enamelled Ware "STANDARD" fixtures represent the highest degree of perfection.

Genuine "Standard" Goods are

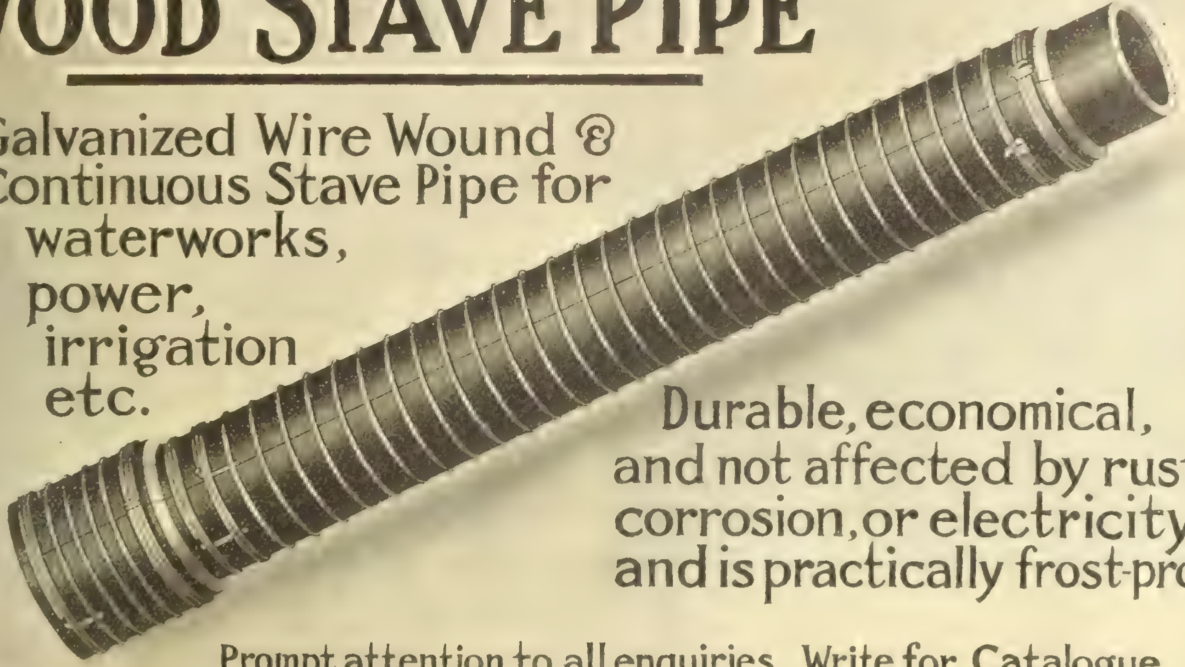
MANUFACTURED ONLY BY

Standard Sanitary Mfg. Co.

Canadian Office: 39 St. Sacrament St., Montreal, P. Q.
Toronto Show Rooms: 55-61 Richmond St. East, Toronto

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

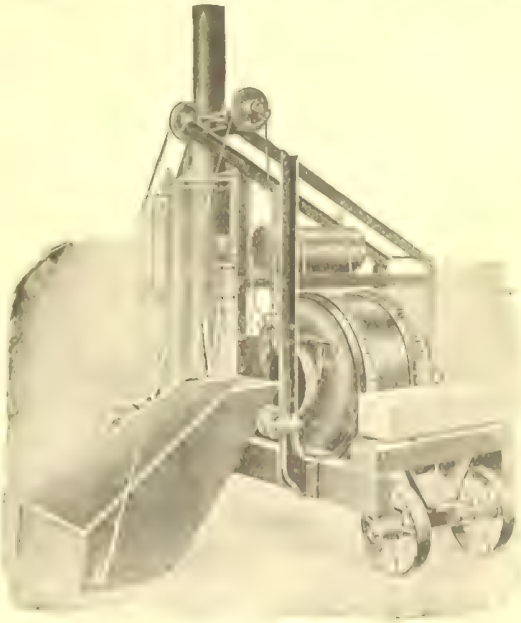
Koehring Concrete Mixers

Steam, Motor or
Gasoline Drive

Simple in Operation

Made in sizes to meet all requirements.

Substantial in
Construction



Koehring Mixers have proved their superiority by quick action — uniformity of mixture and reliability under the most exacting conditions.

MANUFACTURED AND SOLD IN CANADA BY

CANADA FOUNDRY COMPANY, Limited
Head Office, TORONTO
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Henry New Robert W. New

Hamilton Pressed Brick

Two houses erected on Robinson St., for W. G. Bailey, Esq. Steward and Witlor, Architects. Hamilton Pressed Brick are used in above.

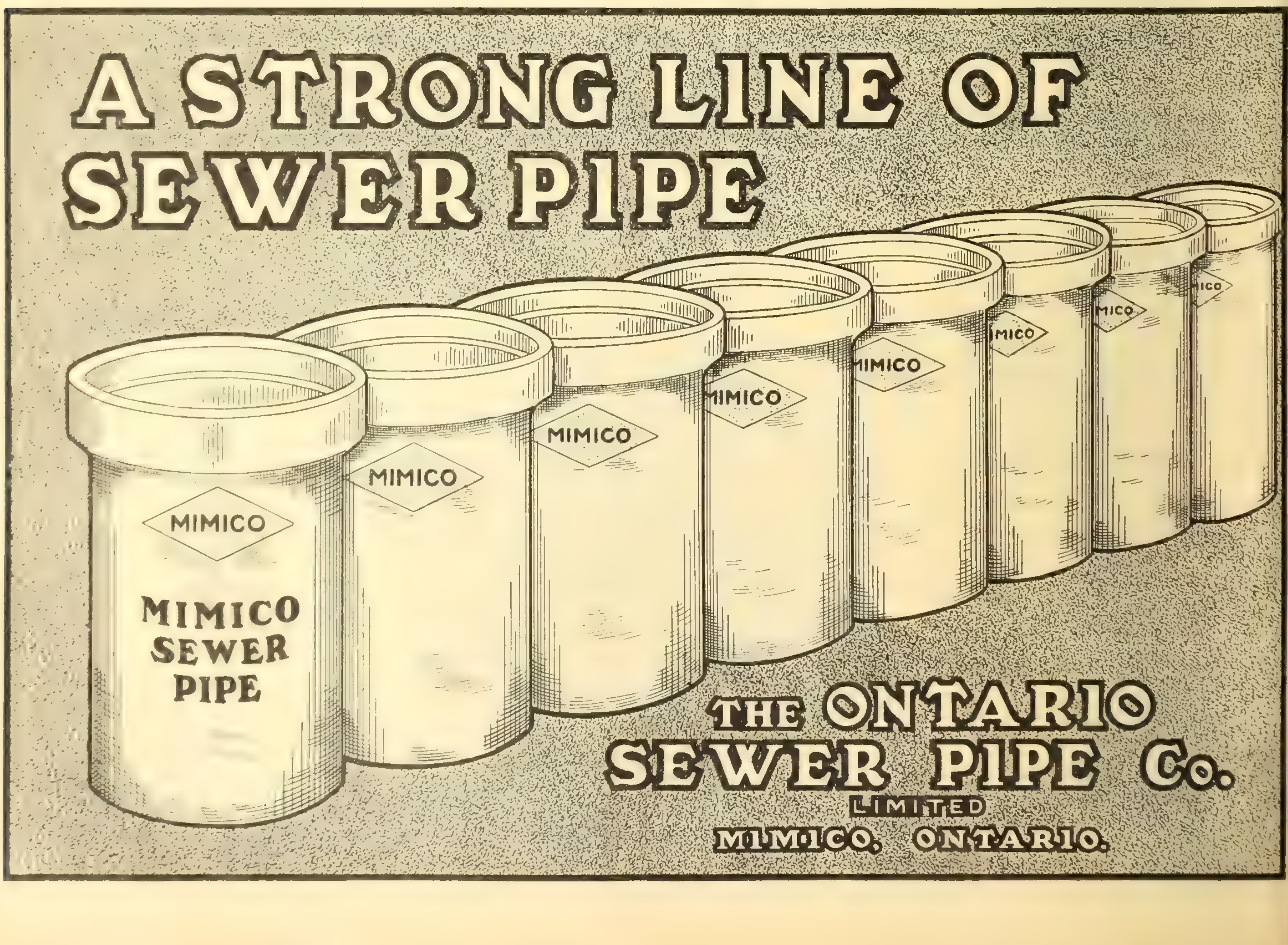
is used by the leading architects and contractors on most modern buildings. Noted for its **warm and pleasing red color.**

Our facilities are unequalled and we can insure prompt and complete deliveries.

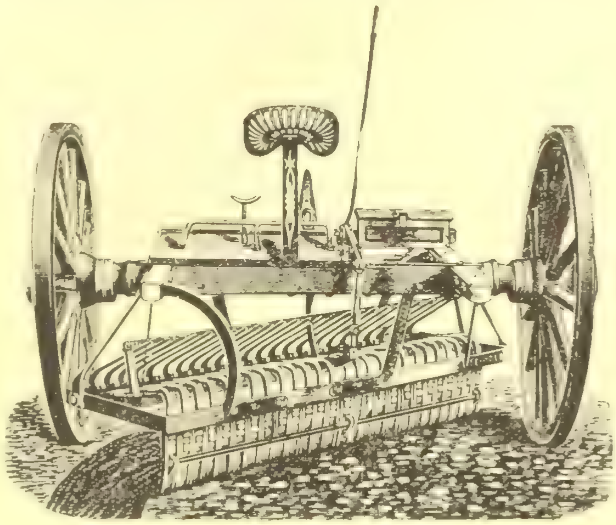
Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931

Head Office: Spectator Bldg., **Hamilton, Ont.**


A STRONG LINE OF SEWER PIPE
MIMICO
MIMICO SEWER PIPE
THE ONTARIO SEWER PIPE Co.
LIMITED
MIMICO, ONTARIO.

The Champion Street Cleaner



—is the only machine that will effectually clean mud and dirt from macadam and stone streets. The teeth or feet are flexible, so that they will follow the indentures of the roadway and the streets can be thoroughly cleaned. Every Municipality should have one or more of these machines. Two horses and a man can thoroughly clean several miles of streets in a day, and it makes no difference how wet and muddy they are—the more so the better This machine has been thoroughly tested for several years, and the following are a few of the points in which it is used :

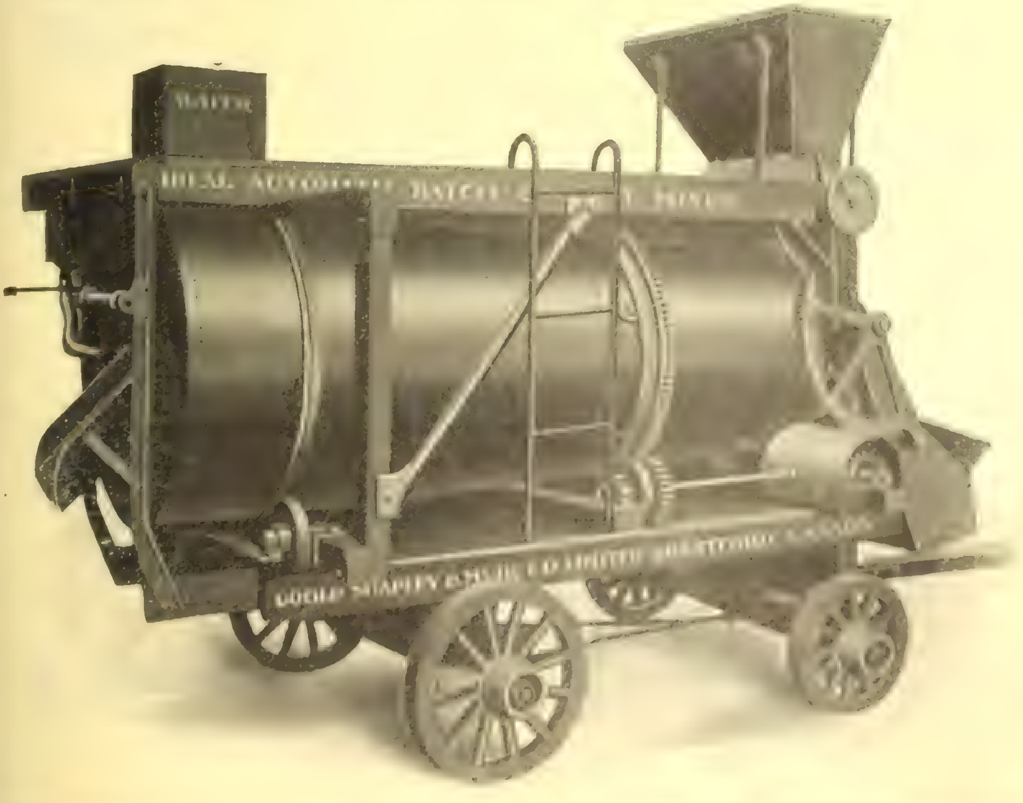
Hamilton, Ottawa, Belleville, Berlin, Peterborough, St. Catharines, Guelph, Quebec, Coaticook, Sherbrooke, Richmond, Three Rivers, Edmonton, Mile End and Vancouver.

WRITE FOR CATALOGUE AND FULL PARTICULARS

American Road Machine Co. of Canada, Limited

GODERICH, ONTARIO

Brantford "Automatic" Batch Concrete Mixer



Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If Interested send for Catalogue.

Goold, Shapley & Muir Company, Limited

Brantford, - Canada

Railway Engineers and Contractors

Timber culverts rot, clay pipe culverts break from frost or weight, metallic culverts rust and are woefully dear, CONCRETE CULVERTS LAST FOREVER and the price is relatively low.

The only absolutely **durable and frost-proof** culvert pipe is

REINFORCED CONCRETE

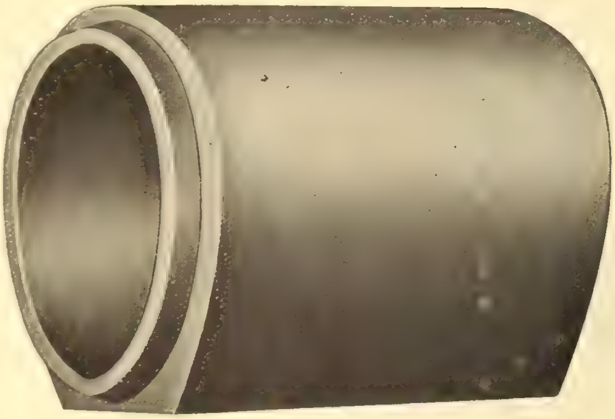
36″ Section

of **first quality.** The prime requisites of first quality concrete are **good raw material, proper proportions,** and **scientifically correct methods.**

We possess all these in the highest degree. Our years of experience, our facilities, and our raw material enable us to make **good concrete** and make it **always good.**

Nowadays the railway engineer must get results in **permanency** as well as in other matters. The contractor too must get results if he is to stay in the game. A very important result to him is the **economy** of buying material that **holds out,** that can be handled with **facility,** and that can be procured **promptly** and at a **reasonable price.**

Don't imperil your interests by using non-durable material, or by trusting to the random hits and misses of a novice when you can buy **durable, mature,** and **guaranteed concrete pipe,** from a long-established and reputable firm.



30″ Section

Mature Stock

Prompt Shipment

Quality Guaranteed

No Loss From Breakage

Low Prices

WRITE FOR CATALOGUE AND PRICES

Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO

Claims are Useless

Unless you can **prove** what you claim

Luxfer Prisms

are claimed to produce certain results and we invite you to come to our test rooms where we can **prove** to your satisfaction every claim that we make.

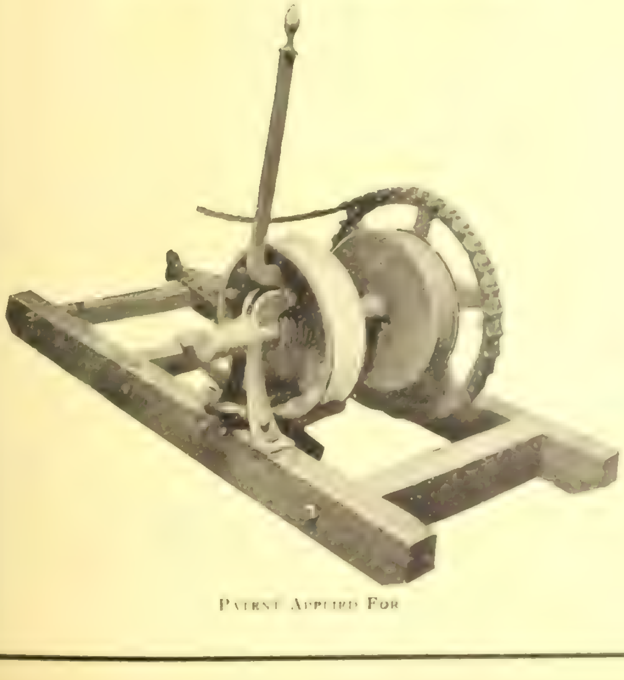
Other manufacturers of so-called prism make claims for their goods but that's as far as they go.

Advise us of your requirements and we will tell whether we can solve your problem but we won't **claim** to do so if we know we can't. Our engineers are at your service.

Luxfer Prism Company, Limited
100 King Street West, TORONTO

If you are investing in a hoist you can't do better than the

"London" Friction Clutch Hoist



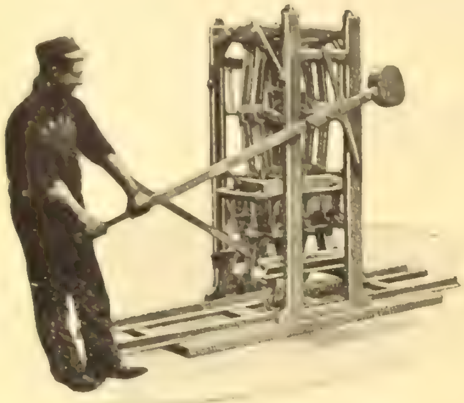
Patent Applied For

Can be used with any make or style of gas, gasoline or oil engine. A coil spring throws the clutch out so the hoist can be operated at a distance by a rope.

Write for circular

The Scott Machine Co.
Limited
Engineer and Machinists
LONDON, CANADA

Somers Pressure Block Machine



This is a Somers Machine.

The strong features are that it creates a dense, compact block, and a guaranteed capacity of 2 blocks per minute with 2 men to operate.

It handles a very wet mixture and makes blocks absolutely uniform.

Blocks are made in both the hollow and two-piece style.

Also Water Tables, Piers, Copings, Corners, Octagons, Chimney Blocks etc.

Write for Catalogue

Somers Brothers Manufacturing Co.

Urbana, Illinois, U. S. A.

A Ready Made Form for Every Size of Concrete Culvert

The Merillat Adjustable Core

An **Economic** and **Satisfactory Solution** for the **Engineer, Contractor, County** and **Townhship Officials.**

Agents Wanted

For every size of Concrete culvert between 20 and 48 inches made with the one machine.

For further particulars write to

The Merillat Culvert Core Co.

16 SPRUCE STREET, WINFIELD, IOWA

Bars for Reinforcing Concrete

PLAIN SQUARES, ROUNDS, FLATS, TWISTED OR SPIRAL

Granada Hotel, Cor. Sutter and Hyde Sts., San Francisco, Cal. Frederick Noonan, Architect.
117′ 6″ facing Sutter St. and 77′ 6″ on Hyde St., 10 stories high. Reinforced with 400 tons steel bars manufactured by
BUFFALO STEEL CO.

Squares and Rounds 3-8 in. to 1 1-4 in. Elastic limit 50,000 lbs and over

Cut to required length. Immediate shipment from stock

Buffalo Steel Co.

Represented by
C. W. NOBLE
Home Life Bldg. Toronto, Ont.

TONAWANDA (Suburb of Buffalo), N. Y.

Canada's Largest Reinforced Concrete Building

constructed throughout in the

KAHN SYSTEM

The new Jacobs Building, the largest reinforced concrete building in Canada, which is now nearing completion at the corner of St. Catherine and St. Alexander Streets, Montreal.
Mitchell and Creighton, Architects

Rapidity of erection was a feature.

ARCHITECTS—If you wish the best material on the market, and adequacy of design, freedom from worry, the services of our splendid organization and engineering department coupled with economical construction

Specify Kahn System

We will cheerfully assist you in any way.

CONTRACTORS—if you desire prompt delivery, materials easy and economical to handle, a great elimination of field labor, materials cut to exact lengths order Kahn System materials:

Kahn Trussed Bars for beams and girders, Cup Bars for floors and columns, Rib Metal for floors and Roofs, Hy-Rib for roofs, walls and partitions, Rib Lath for plaster work, Column Hooping, Trussed Chemical Products including waterproofers and finishers

Trussed Concrete Steel Co., Limited

Head Office and Works: WALKERVILLE, ONT.

Branches: Toronto, Montreal, Winnipeg, Vancouver

The Municipal Construction Co.

Limited

Contractors for
Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED STONE

All Sizes

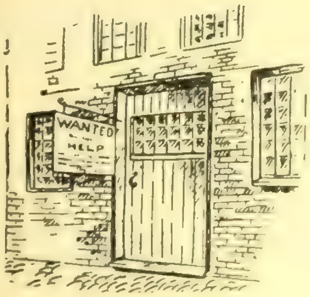
¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**



In Olden Days

The way to fill a vacant position was to hang out a sign on the Street

The 20th Century Way

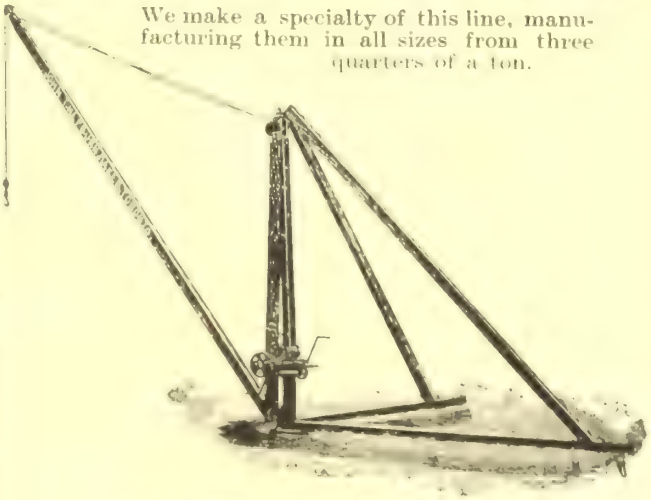
is to advertise in the condensed columns of the **Contract Record** where you will get plenty of results.

When you have a vacancy or need a position as draughtsman, clerk of works, building superintendent or in any other, contracting, engineering, municipal or architectural capacity, let us print your want and prove to you the power of this paper.

Contract Record
Toronto - - - Canada

Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Earth Wonder Cement Block Machine" and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds

Prices on application

JOHN T. HEPBURN
18-34 Van Horne St., Toronto, Canada

A Quiet Tip to Contractors

Everything Considered

PERFECTION WIRE MESH
(Canadian Made)

is the lowest priced concrete reinforcement for short spans there is on the market. It lays without lap too. Every ounce counts.

A suggestion that you ask for quotations when interested is only necessary if you have never seen our prices.

CLARENCE W. NOBLE
117 HOME LIFE BUILDING - TORONTO, ONT.

Pine Doors

We have long appreciated the fact that price is not the only requisite an architect, builder or contractor must seek in placing his order for doors. Poorly manufactured doors can scarcely be considered a bargain at any price.

Door Making is our Specialty

We have equipped our plant with the best door machinery made, and turn out doors that are right in quality and right in price.

Our doors need no commendation. They prove themselves.

Prompt deliveries. Write for prices.

Wholesale or retail dealers in lumber, doors and trim.

L. A. DeLaplante, Limited
212 Main St., Phone Beach 230 TORONTO

Some Reasons Why You Should Recommend

PRESTON CEILINGS

If you are a progressive builder or contractor we ask you to advise and recommend the use of PRESTON Ceilings for the following reasons:—

First, because we use superior dies and the heaviest drop presses and are thus able to bring out every detail of the design clearly and accurately.

Second, because the joints are easy to fit and become a part of the design. The whole ceiling harmonizes in every particular.

Third, because Preston Ceilings, Walls, Cornices, Mouldings, Centre Plates, etc., are classified so that the designs will match.

Fourth, because Preston Ceilings are fireproof, never warp, crack or fall down, and can be easily washed.

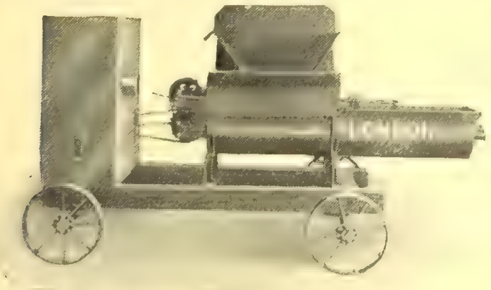
Fifth, because Preston Metal Ceilings cost no more than the ordinary kinds, yet are far more artistic.

Send us your name and address so that we can mail you a copy of our handsome book of Louis XIV, Gothic and Colonial designs.

METAL SHINGLE & SIDING CO., Limited, Preston, Ont.
Branch Office and Factory, MONTREAL, P. Q.

"London" Automatic Batch Concrete Mixers

With these machines you can defy competition. WHY DOES IT SAVE YOU MONEY? Simply because the materials ONLY HAVE TO BE HANDLED ONCE. NO EXTRA SHOVELLING, NO WHEELING, NO MEASURING. Just KEEP THE HOPPERS FULL AND THE MACHINE WILL DO THE REST. Will give any DESIRED PROPORTION, WILL MIX ANY KIND OF MATERIAL with any consistency of moisture.

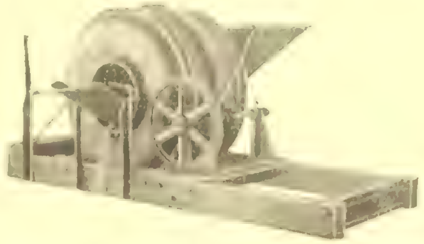


London Automatic Batch Concrete Mixer, No. 1
Capacity 50 yds. per day. Price without power, $160.00.
Complete as shown in illustration, $290 00.

London Automatic Batch Concrete Mixer, No. 2
Price, complete as shown, $390.00. With three hoppers, $405 00.
Capacity with two hoppers 75 yds. per day; with three hoppers, 150 yds. per day.

MEASUREMENTS ABSOLUTELY PERFECT. This machine is selling AS FAST AS WE CAN MAKE IT. Only eleven months on the market; over One Hundred and Twenty have already been sold locally. LET US SEND YOU A LIST OF OUR CUSTOMERS.

We also manufacture a STANDARD DRUM BATCH MIXER in four sizes, namely, 7 ft., 10 ft., 20 ft., and 30 ft. per batch. When writing for catalogue of mixer always state capacity desired. We also manufacture Face-Down Concrete Block Machines, Cement Brick Machines, Power Cement Drain Tile Machines, Sill Step and Window Cap Molds, Concrete Fence Post Molds, Concrete Sewer Pipe Molds, Concrete Block and Brick Cars, Wheelbarrows and Carts, Ornamental Pier Block and Porch Column Molds, Baluster Molds, Lawn Vase Molds, Hitching Post Molds, Mortar Screens, Mortar Hoes, Sidewalk Tools, and a full line of Cement Working Tools. Our large catalogue mailed on request.



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Four sizes and furnished with any equipment

London Concrete Machinery Co.

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Limited

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High Class Interior Fittings

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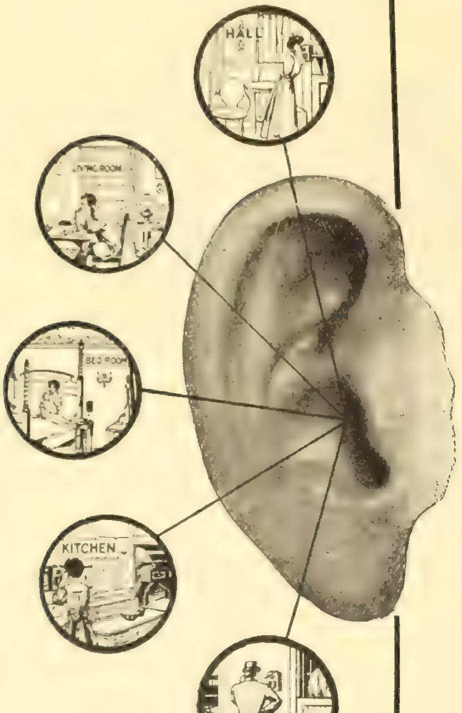
is a composition flooring that is durable, jointless and noiseless. Guaranteed to be insect, dust, water and fire proof. Dados, wainscoating, centre pieces, etc. Designs of every description. Estimates free. We are contractors for tile and concrete flooring.

The Sanitary Floor Co.

544-546 King Street West. - - Toronto, Ont



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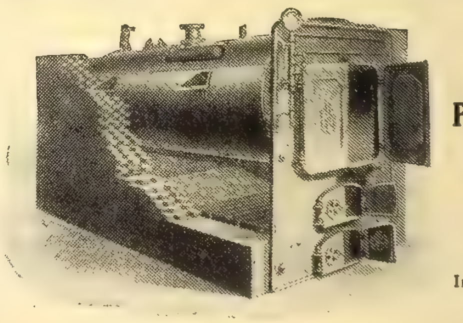

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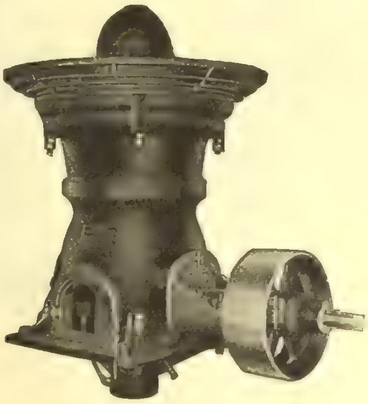

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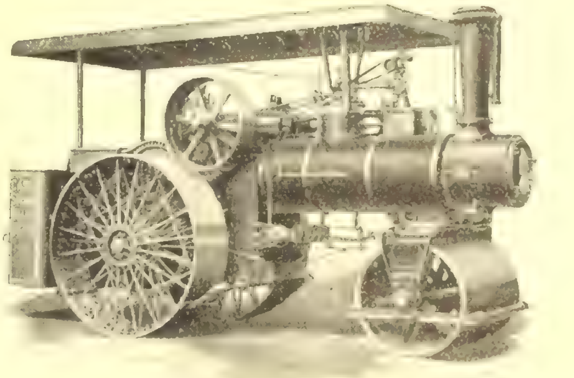

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Prices subject to change without notice.

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All sizes 3 inches to 36 inches single and double strength

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Salt Glazed and Vitrified

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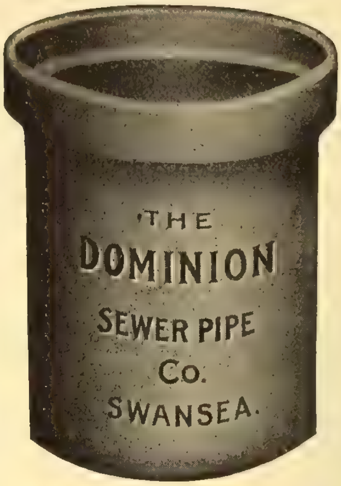

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It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

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To the corporations, dealers and contractors of this country.

" 1910 promises to be still larger " excellent delivery, quality the best, prices right.

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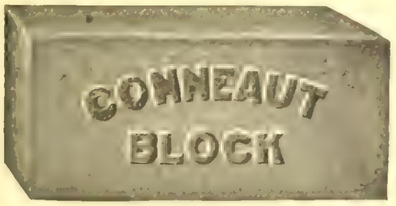

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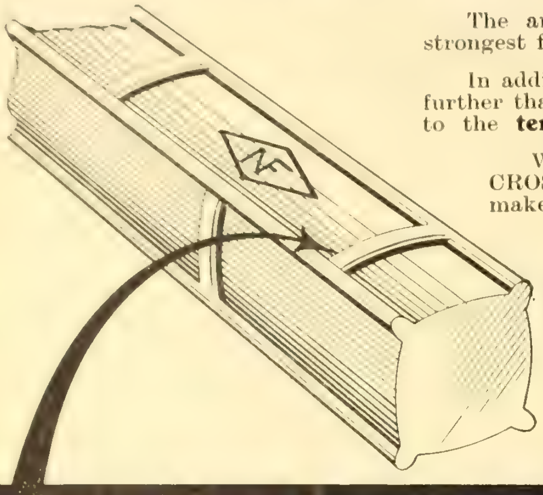
It Adds to Strength and Lessens Strain

Here is a cut of a section of the

"NF" Reinforcing Bar for Concrete



The arrow points out the **longitudinal rib** which is one of its very strongest features.

In addition to the usual advantages claimed for deformed bars, we claim further that the **longitudinal ribs** on the four corners of the (NF) Bar add to the **tensile strength** and prevent **torsional strains** in the concrete.

We have proven this to be an established FACT. In addition the CROSS RIBS form a mechanical bond, so that less metal is required to make a PROVEN BOND under OURS than under any other system.

Does this mean anything else than a SAVING in COST, not only in the **first instance** but so long as the **building will stand**? Is it possible to figure the case out in any other way?

We should like to send you some literature on this point, may we?

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

rnaby, B.C.

This municipality will shortly call for nders for waterworks construction.

lleville, Ont.

Tenders addressed to James G. Lindsay, ty engineer, will be received until April h for the construction of a trunk sewer Dundas street.

Tenders will be received until Thurs-y, April 7th, for tne construction of a unk sewer on Dundas street. James G. indsay, city engineer.

amilton, Ont.

Tenders have been called for excava-on work required in the laying of about miles of water pipes. S. H. Kent, city erk.

untsville, Ont.

On April 11th a bylaw will be voted on issue $12,000 5 per cent., 20-year street provement debentures. T. M. Cullon, erk.

ontreal, Que.

The Board of Control have approved of urveyor Barlow's report requesting $2,-77,874 for permanent works. The more nportant items comprise the following:—herbrooke street, relieving sewer, section o. 3, $57,500; section No. 6, $65,000. Main wer for Laurier ward to Back river, 40,000; outlet for sewer now emptying to Elgin Basin, sewerage pumping plant r William street district, and outlet for wer at Victoria bridge, $237,000; replac-g old pipes and small sewers with three-ch and two-inch brick, $100,000; perma-ent pavements, $1,000,000; permanent dewalks, $251,808; stone and other cross-gs, $30,000; installation of street gullies, 20,000.

Permission is being asked from the Que-ec legislature by Messrs. J. A. Prender-ast, J. T. Laurendeau and Joseph Ver-ailles to construct the "Montreal East oulevard." The scheme involves the con-truction of a driveway 500 feet wide, from ontreal East to Bout de l'Ile. It is stated hat construction will be started when the uthority is granted and the work will be nished within three years.

orth Vancouver, B.C.

The two bylaws submitted for the pur-ose of raising $20,000 and $5,000 for earing and constructing sidewalks re-pectively, have been passed.

rince Albert, Sask.

The bylaw providing $20,000 for the vaterworks extensions will be voted upon n April 16th.

t. Lambert, Que.

The town council have ordered the pre-aration of specifications with a view to certain the cost of extending the water nd sewer mains to Southward, the newly acquired property of the St. Lambert Land Company.

Souris, Man.

Surveys are being made for the proposed sewage disposal and waterworks systems.

Sawyerville, Que.

A bylaw authorizing the town council to buy waterworks from the Sawyerville Water Company was carried on the 30th ulto.

Toronto, Ont.

On April 9th a bylaw will be submitted to the ratepayers to raise $279,000 for the extension of the water mains.

The time for receiving tenders for the intake pipe has been extended until April 15th. See advertisement in this issue.

Vernon, B.C.

Work has been started by Col. Tracy, of this city, on the construction of the waterworks system of Delta municipality. About forty miles of mains will be laid, the work to cost over $100,000.

Victoria, B.C.

It has been decided by the provincial minister of public works to proceed shortly with the paving of the roadways about the government buildings in this city, the Hassam pavement having been selected. Estimated expenditure, $20,000.

Vancouver, B.C.

Tenders were opened as follows for block pavements: Robson street, Homer to Hamilton, Palmer Bros. & Henning, $5,359; T. R. Nickson & Company, $4,500; M. P. Cotton, $4,427. Robson street, Seymour to Hamilton, Palmer Bros. & Henning, 14,457; T. R. Nickson & Company, $13,400; M. P. Cotton, $13,342. Robson street, Hamilton to Cambie, Palmer Bros. & Henning, $6,878; T. R. Nickson & Company, $6,150; M. P. Cotton, $6,175. Westminster avenue, Park Lane to bridge, Palmer Bros. & Henning, $5,481; M. P. Cotton, $5,128. Stone block paving of lane between Seymour and Granville, one block, Palmer Bros. & Henning, $5,989; T. R. Nickson & Company, $4,887; M. P. Cotton, $4,826; Maurice & Abel, 4,826. For the laying of concrete curbs the only tender was that of Stewart Hull at 66 cents per lineal foot. A single tender was also sent in for the city's supply of cement, Evans, Coleman & Evans offering the product at the same price as last year, $2.45, delivered at points ordered. A reduction of 15 cents per barrel was made for delivery at the company's wharf. All tenders were referred to the engineer for report.

Yorkton, Sask.

This municipality is calling for tenders for furnishing and constructing of approximately [illegible] square feet of [illegible]. T. McArthur, B.Sc., town engineer. For further information, see advertisement in this issue.

AWARDED

St. Catharines, Ont.

The Water Commissioners [illegible] tenders for valves and [illegible] from Doherty & Company, Sarnia; Bingham & Taylor, and the Jenckes Machine Company of this city. The latter was accepted.

Tenders were received from Tittering-ton & Company at 23 cents each, and H. Wise for 250 cedar posts for the reservoir fence. The former was accepted.

Several tenders for wire fence were received, that of Robert Cameron at 48 cents per rod, incuding erection, being accepted.

Vancouver, B.C.

City Council awarded contracts for material for road and sidewalk work as follows: Filling, sand and 20 per cent. of the gravel to the Lineham-Scott Sand & Gravel Company, and the balance of the gravel to the Royal Bay Company. The Lineham Company tender for filling is 88 cents and sand at $1.08 per yard and gravel at $1.35. The Royal Bay Company will supply gravel at $1.15 per yard.

Railroads, Bridges and Wharves

Brantford, Ont.

The bylaw to raise $50,[illegible] to construct new South Market bridge was carried.

Calgary, Alta.

Mr. J. S. Denis, assistant second vice-president of the C. P. R., has been appointed superintendent of the new $12,000,000 irrigation scheme which will be carried out in the Bow river district.

County of Hastings, Ont.

On the 22nd June the county council will consider a bylaw to issue $20,000 20-year bridge debentures. A. M. Chapman, county clerk.

Edmonton, Alta.

Location and surveying work on the Great Waterways Railway has practically ceased, and all plans for the construction of all but the first fifty miles from Edmonton has been abandoned pending the investigation by the Royal Commission.

Fort William, Ont.

Tenders are being called until April 11th by the C. P. R. for construction of machine shop here, also for ditching along the line between this place and Winnipeg, Man. Plans, etc., at office of resident engineer, this city. F. Lee, division engineer, Winnipeg.

Merritt, B.C.

Messrs. [illegible] and Morrison, Spokane, Wash., are among the tenderers for the Kettle Valley line, on which construction is reported to start about the first of May. Tenders are to be in by the 15th inst.

Quebec, Que.

Hon. Mr. Taschereau, minister of public works, has announced that [illegible] would be voted this year for [illegible] bridges.

The Finance Committee [illegible] that if the Quebec [illegible] Railway does not begin the construction of its work [illegible] granted by the [illegible] Legislature.

Stratford, Ont.

G. T. R. officials, including First Vice President Fitzhugh, Chief Engineer Kelly and Manager Brownlee, have submitted a proposition concerning a new railway station to the city officials. The company will erect a station of the most modern type, and equip a new foundry and frog and track equipment shops, at a cost of $200,000 to $250,000, provided the city will close a portion of Downie street and build a subway on Nile street to carry traffic under the tracks. Mr. Fitzhugh stated that as soon as he received word that the city was prepared to do its part the work would be commenced at once and completed as soon as possible. He would expect the shops to be finished this year and in operation.

St. John, N.B.

It is reported that the G. T. P. have purchased land around the head of Courtenay Bay to be used as a site for their terminals.

Trail, B.C.

The C. P. R. has under consideration the erection of a new six stall roundhouse, to be built of brick, at Smelter Junction during the coming summer.

Whitemouth, Man.

The settlement bridge north of the town was destroyed by the outgoing ice on the 28th ulto.

Winnipeg, Man.

The plans of the McPhillips street subway, submitted by the C. P. R., were approved. The specifications are left to the city engineer and the company's engineer, and in case of disagreement the railway commission will decide. Work on the subway will begin very shortly.

The C. P. R. are calling for tenders until April 11th for station at Stonewall, Man., and machine shop at Yorkton, Sask. Frank Lee, division engineer.

There is a report to the effect that the Chicago, Milwaukee & St. Paul Railroad will run into this city. A survey has been made to Valley City.

AWARDED.

Battleford, Sask.

J. Daudelin, of Battleford, has been awarded the contract for grading the Biggar-Battleford branch of the G. T. P.

Gaspe, Que.

The contract for the deep water wharves has been secured by Messrs. Dussault, of Levis, at a price of $275,000. Work will start in April.

Portage la Prairie, Man.

J. G. Hargrave & Company, of Winnipeg, have been awarded the contract for grading the double track on the C. P. R. from Winnipeg to this place. This work will commence at once and the line will be in operation this year.

Regina, Sask.

The contract for the construction of the G. T. P. from Regina south to the boundary near Portal, has been awarded to the J. D. McArthur Company, of Winnipeg.

Victoria, B.C.

Armstrong & Morrison, of Vancouver, have a contract for the construction of twenty-five miles of the Island Valley Railway. The promoters are John Castleman, William T. Corry and William Henderson, of Vancouver. Estimated expenditure, $500,000.

Winnipeg, Man.

The contract for railway asphalt plant has been awarded to P. D. Cummer & Son Company, of Cleveland, O., for $16,500; it will have a capacity of 1,800 yards.

Public Buildings, Churches, Schools, etc.

Brantford, Ont.

The bylaw to raise $100,000 to erect buildings for market purposes only was defeated; that to construct two schools at a cost of $30,000, was carried.

Calgary, Alta.

It is reported that Calgary Odd Fellows will erect a $100,000 temple.

Crandall, Man.

A vote of the ratepayers taken on a bylaw to enlarge the public school was carried.

Edmonton, Alta.

The ratepayers will vote on the 21st of April on a bylaw to raise by debentures the sum of $34,500 for the building of two new fire halls and hose tower.

Hamilton, Ont.

A bylaw to authorize the expenditure of $40,000 for the erection of a House of Refuge will be submitted to the ratepayers on June 6th.

Architect McPhie and Controller Cooper have been given authority to curtail the cost of the new registry office so that it may be built on the present expropriation. Noted in last issue.

Halifax, N.S.

Messrs. Ross & Macfarlane, architects, 1 Belmont street, Montreal, are the architects for the new Y. M. C. A. here. Tenders closed on the 6th inst.

Hull, Que.

It is stated that the Presbyterian church will erect a Protestant school in Wrightville. Purchase of site being negotiated by Mr. D. G. Currell.

Kamloops, B.C.

Perry Bros., the Vancouver contractors, who are to build the new convent, have begun operations, and will push the work to completion as rapidly as possible.

Kildonan, Man.

The bylaw to raise $11,000 by the sale of debentures for school debentures will be sent by the council to the ratepayers for ratification.

Kingston, Ont.

Tenders will be received at the office of the Registrar, Queen's University, until April 7th, for the erection of the Nicol Building. Power & Son, architects.

Markdale, Ont.

A bylaw has been passed to issue $5,000 school building debentures.

Montreal, Que.

Tenders will shortly be received for the construction of additions to St. Clement's church, Verdun, Que. Ross & Macfarlane, architects, Belmont street.

Plans for a banc d'œuvre for a Grand Mere, (P. Q.) church are being prepared by Messrs. MacDuff & Lemieux, architects, Merchant's Bank Building.

Tenders will be received until April 7th for the construction of the new wing for the Medical Building at McGill University. Brown & Vallance, architects, Canada Life Building.

Plans and specifications are in course of preparation by Ross & Macfarlane, architects, 1 Belmont street, for the Central Y. M. C. A. building on Drummond stre and for the Westmount Y. M. C. A. bui ing, corner Arlington avenue and Sh brooke street.

It is stated that the building committ of the Art Association, Montreal, on t advice of Mr. Edmund Wheelwright, a p minent Boston architect, have decided ask competitive designs from the foll ing architects: Messrs. Brown & Vallan E. & W. S. Maxwell and Professor Pe Nobbs, McGill University, for their n building to be erected on the Holton p perty corner Ontario avenue and Sh brooke street. It is expected that the pl will be prepared by June and a decisi given by the middle of the month.

Moose Jaw, Sask.

The congregation of St. Andrew's Pr byterian church are negotiating for a s for their new church.

D. W. F. Nichols, architect, will prep plans for the Y. M. C. A. buildings h and at Port Arthur. E. M. Thomass local secretary.

North Battleford, Sask.

The skating and curling rink here v destroyed by fire on the 28th ulto. E mated total loss, $9,500.

North Vancouver, B.C.

This municipality has carried a byl providing $17,200 for new schools.

Oshawa, Ont.

The Oshawa Golf Club will proba build some additions to their club ho shortly.

Portage la Prairie, Man.

The bylaw to borrow $20,000 to be u in the construction of a new school in Galician settlement, has been carri Work will begin at once, and it is und stood that H. Mathews, of Winnipeg, is be the architect.

Revelstoke, B.C.

The Revelstoke School Board having titioned the city council for $30,000 by for a new school building on block South East street, the city council has ed the Board to reconsider its propo with a view to a plebiscite being ta in respect of the selection of a site.

Rodney, Ont.

Tenders were called on the 5th inst. the town hall building here. A. E. Hug clerk of Aldborough Township, Rod P.O.

Saskatoon, Sask.

Tenders for the building of the uni sity here have been opened. It was fo that the lowest tenders exceeded the mated cost and consequent government propriations by about 20 per cent. matter will be more fully considered.

South Middleton, Ont.

Tenders will be received by Geo. Fis secretary treasurer, until April 20th, the re-construction of the schoolhous S. S. No. 7. Plans, etc., at residence of above mentioned.

Springfield, Man.

The ratepayers will vote on April on a bylaw to issue $1,500 school del ures. C. Christopherson, secretary-tre er.

Sudbury, Ont.

The council have decided to erec once a new municipal building and t cept the design submitted by Jas. T son, architect, Aberdeen chambers, T to. Estimated expenditure, $25,000.

Toronto, Ont.

The High Park Methodist Church will proceed at once to erect their Sunday school building. Estimated expenditure, $20,000.

It is reported that the Bishop Strachan School Board has purchased a site of five acres bounded on the south by Davenport road on the west by Christie street and on the north by the Edwards estate.

The management of Knox College have bought the residence of Mr. W. H. Brouse, 63 St. George street, which adjoins property already in their possession, on which they may start the erection of their new college in the near future.

Tenders addressed to Gordon & Helliwell, architects, Confederation Life Building, will be received until April 2th for the various trades required in the erection of fireproof building on College street for the Upper Canada Bible Society.

Tenders will be received until April 12th for all trades required in the erection and completion of a three storey fireproof museum building for the University of Toronto. Plans, etc., at office of the architects, Darling & Pearson, 2 Leader Lane, Toronto.

A building permit has been granted to the Church of the Epiphany for their church, on the southwest corner of Queen and Beatty, $40,000.

Vancouver, B.C.

The negotiations with Dominion Government have been successful, and the site for the new isolation hospital will be on the Admiralty Reserve.

It is posible that a school will be erected in South Mount Pleasant. Others to be erected are: Corner of Bismarck and Charles streets, Grandview; Cypress and Maple streets, Kitsilano, and on Fifteenth avenue, Fairview, between, Alder and Spruce streets.

Westboro, Ont.

Tenders are now being let for the new $15,000 six-room brick school here. It is expected that work will be commenced on the school inside of a week.

Winnipeg, Man.

Permits were granted to Young Methodist Church and to the Fort Rouge Methodist congregation. The cost of the former will be $72,000, and that of the latter, $45,000.

J. B. Mitchell, of the school board offices, recently submitted for approval the plans for the new Lord Roberts school, to be erected on the west side of John street, between Beresford and Rathgar; cost $86,000 with the heating equipment included.

Division of expenditure on hospital is reported as follows: Extension of General hospital, $300,000; auxiliary hospital to General, $100,000; isolation hospital, $100,000; tubercular hospital, $75,000; and morgue, $25,000. Noted in last issue.

At a meeting of the parishoners of St. John's, plans for a projected new cathedral came up for discussion. [illegible] 200 feet long, width of transept, 120 feet. Cost, $250,000. Building committee, A. Code, J. A. Machray and others.

The directors of the St. Charles Country Club have decided to rebuild the club house recently destroyed by fire. Tenders for the erection of a temporary club house will be called at once. Plans of the new permanent building will be considered at a meeting of directors to be held in the near future. G. W. [illegible] is mentioned as architect.

AWARDED.

Montreal, Que.

The general contract for the erection of the school for the Reverend Sisters of the Holy Cross, on St. Hubert street, has been awarded to T. Lessard & Sons, Limited. Jos. Sawyer, architect.

The Protestant Board of School Commissioners have awarded the general contract for the erection of the William Dawson School on Christopher Columbus avenue to Messrs. Gray & Wighton. Mr. A. F. Dunlop, architect, Lindsay Building.

St. John, N.B.

At a meeting of the Exhibition Association directors, the following tenders for the erection of the new buildings were recommended for acceptance: A. E. Hamilton, new horticultural building; S. A. Willams, grand stand. In the case of the horticultural building, the masonry must be completed by May 15th, and the whole building be ready by July 1st. Work on the other contracts must be commenced by May 1st, and completed July 1st.

Toronto, Ont.

The contract for the masonry work of the new addition to the House of Industry has been awarded by the Board of Control to Witchall & Son, 163 Havelock street, at $5,937.

The Board of Education have accepted the following tenders in connection with the enlargement of Balmy Beach School: Masonry, R. Chalkley & Sons, $9,559; concrete floor, A. Gardner & Company, $1,840; carpentry, M. Hutchinson, $7,230; roof and tinsmithing, A. B. Ormsby, $1,304; plastering, Geo. White, $1,165; painting, Jas. Finnemore, $620; plumbing, Fiddes & Hogarth, $1,059; structural steel, Reid & Brown, $1,048; heating and ventilating, Pease Heating Company, $795; electric wiring, Hall & Doherty, $67. Total, $24,687.

The following tenders for erection of isolation hospital have been accepted:—Masonry, Orr Bros., $30,796; carpentering, M. Hutchinson, $18,678; painting and glazing, James Casey, $1,985; roofing, etc., Douglas Bros., $2,150; plastering, Beaver & Company, $4,500; flooring, Terrano Company, $1,022.20; tiling, Luxfer Prism Company, $1,577.80; electric wiring, Bennett & Wright Company, $1,223; plumbing, Keith & Fitzsimons Company, $5,840; steam heating (vacuum system), Purdy, Mansell, Limited, $6,262; total, $74,034.

Winnipeg, Man.

The contract for the new Lord Roberts' school, in the Rosedale district of Fort Rouge, was let to J. H. Tremblay & Company, being $76,000. Work on the contract will begin at once. The plans of the new collegiates were also under consideration.

The contract for the erection of the new Methodist church to be erected on the corner of Broadway and Furby streets by Young church congregation has been let to Clark & Mitchell, contractors. James [illegible] & Son, architects. [illegible] $70,000. Contracts for finishing work, amounting to $8,000, will be let later.

Contract for the general construction of the Orpheum [illegible] has been awarded to Hazelton & Wallin, of Chicago, Ill., at $150,000. It is also stated that the [illegible] and lighting have not yet been placed. [illegible] atre construction, associate.

Residences

London, Ont.

Mr. F. Lashbrook has taken out a permit for a two storey brick residence on St. James street $5,000.

Montreal, Que.

MacDuff & Lemieux, architects, Merchants' Bank Building, are preparing plans for a residence for Mr. Fortin to be erected on the corner Mount Royal and Park avenue.

Plans and specifications are being prepared by Messrs. MacDuff & Lemieux, architects, Merchants' Bank Building, for a bungalow to be erected at Rigand, Que., for Mr. Meilleur.

Plans for a country house at Pincourt, Que., for Mr. J. W. Fontaine, are being prepared by MacDuff & Lemieux, architects.

Plans and specifications are being prepared for a bungalow to be erected at Quinchien, Que., for L. A. Jacques. MacDuff & Lemieux, architects.

Plans for a country house at St. Jeanne, Ile Perrot, Que., for Mr. L. Lemieux, are being prepared by MacDuff & Lemieux, architects, Merchants' Bank Building.

Tenders are now being received for the erection of a residence on Kensington avenue for Mr. John McKergow. Marchand & Haskell, architects, Guardian Building.

Outremont, Que.

Recent building permits include: Mr. Orbin, residence on St. Catherine road, $20,000; Robt. Neville, four houses on Derippe avenue and four on Bloomfield avenue; residence on St. Louis street, $15,000; J. Seath Smith, architect, Montreal.

Owen Sound, Ont.

Tenders will be received until April 8th by Forster & Clark, architects, for the several trades required in the erection of a residence on First avenue west. Plans at office of the above.

Ottawa, Ont.

Mr. Alwyn Bate has bought the southeast corner of Somerset and Lyon streets, on which, it is reported, he will erect an apartment house.

Mr. F. L. Campbell will erect an apartment house this summer on Preston street near Somerset.

Sydney, N.S.

A building permit was issued by the city engineer to Harold Miller for the erection of a dwelling on Park street. A. H. Robb, contractor. Cost, $2,200.

Toronto, Ont.

Two new brick veneer residences, 1079 and 1081 Keele street, owned by the Union Stock Yards Company, were damaged to the extent of about $2,500.

[illegible] mit for six pair semi-detached two storey [illegible] 000.

Winnipeg, Man.

I. Ripstein, it is reported, has bought the lot on Kennedy street opposite Government House, on which he will erect a [illegible]

A. B. Kent has secured a permit for the erection of an apartment block on the southeast corner of Colony and St. Marys. The building will contain twenty nine suites and will cost $50,000.

[illegible]

[illegible] W. W. Blair is the architect, and the [illegible] Company the builders. Construction will start at once.

W. A. Irish has secured a permit for the erection of an apartment block to cost $[illegible], to be erected on the east side of Vaughan, between St. Mary's and the Court House.

Williamson Bros. have received a permit for the erection of an apartment block on the northwest corner of Notre Dame and Kate street, [illegible].

Permits for houses have been issued as follows: Geo. Market, east side Alverstone, between Notre Dame and Yarwood, $3,000; R. Ward, south side Matheson, between Main and Norman, $2,500; Arni Eggertson (two), east side Agnes between Sargent and Wellington, $6,000; W. Webster, east side Arlington, between Bath and Ida, $2,700; W. G. Louden, north side Polson, between Main and Mac, $2,500; Lance Hall, west side Banning, between Einarson and [illegible], [illegible].

AWARDED.

Elora, Ont.

Mr. Jerry Wright, near Marden, has awarded contracts for his house as follows: carpentering, Wm. Sheppard; brick work and plastering to David Ritchie, and the painting, etc., to Wm. Bergin. Cost $2,500.

Montreal, Que.

MacDuff & Lemieux, architects, Merchants' Bank Building, have awarded contracts as follows for the erection of a flat on Westmount Plateau for W. Beaupre & Sons. Stonework C. Charbonneau; brickwork, J. Legault & Company; carpentry, V. Saurette; plastering, A. Lacroix; plumbing, heating and ventilating, J. Labelle; painting, J. Rodrigue.

The contract for the erection of a residence on Columbia avenue, Westmount has been awarded to S. M. Hartman. R. Montgomery Rodden, 8 Beaver Hall Square, architect.

The contract for the erection of six flats on Mitcheson street for Mr. Bernstein has been awarded to Messrs. Share & Gersovitz. Mr. C. Dufort heratecitETAOINN vitz. Mr. C. Dufort, architect, La Patrie Building.

Victoria, B.C.

D. H. Bale has been awarded the contract for a modern residence for Mr. Geo. W. Cramer to be built on Third street.

Business Buildings and Industrial Plants

Brandon, Man.

The Codville Company have decided to build a three storey warehouse on the site of their building on Pacific avenue.

The Hanbury Company in addition to other new structures, will extend and improve their mill and factory.

It is stated that G. and N. J. Beattie, of Fergus, Ont., have concluded arrangements for a building site, 60 by 80 feet, between Fifth and Sixth streets, on which they will erect a large warehouse.

Chatham, Ont.

The buildings occupied by King, hardware merchant, C. Austin Company, and G. Meynell were damaged by fire on the 31st ulto. Estimated total loss, $40,000.

Edmonton, Alta.

Tenders for the erection of a building for the National Trust Company will be received until April 7th. Plans, etc., at the office of the architect, John D. Atchison, Bank of Toronto Building, Winnipeg.

Fernie, B.C.

Plans have been prepared and tenders invited for the construction of a new two storey bank building for the Home Bank of Canada in this city; frontage, 30 feet on Victoria avenue and 60 feet on Cox street; materials, cut stone and pressed brick.

Hamilton, Ont.

It has been announced that the Ludlan-Ainslie Lumber Company, of Leamington and Sarnia, will locate here. Property in the east end with a frontage of 500 feet, has been purchased, on which they will erect two large buildings. A. F. Hatch, of Canada Steel Goods Company, is director.

London, Ont.

It is reported that Dennis Wire & Iron Works will extend their plant, and that a steel company have bonded sites near the McClary Manufacturing Company.

Moosomin, Sask.

The Dominion Elevator Company's new elevator was destroyed by fire on the 30th ulto.

Moose Jaw, Sask.

The Bank of Montreal have purchased property, 50 by 125 feet, on the corner of Fairford and Main streets, as a building site.

Medicine Hat, Alta.

The Bank of Montreal has purchased a $10,000 site on Toronto street on which to erect a bank building this year.

Manor, Sask.

The Hotel Manor, Hewitt's hardware store and Sharpe & Company's general store were destroyed by fire on the 2nd inst. Losses respectively are, $18,000; $8,500 and $28,000.

Montreal, Que.

Plans and specifications have been completed by Messrs. Ross & Macfarlane architects 1 Belmont street, for the erection of an eight-storey building on St. Catherine street for the Willis Company; tenders will shortly be received for construction of same.

Tenders were received up to April 6th for the erection of four flats and two stores on Cadieux street for Mr. R. Marks. Mr. C. Dufort, architect, La Patrie Building.

Plans and specifications have been prepared and tenders received for the construction of a modern ten storey fireproof office building at the corner of Dollard Lane and St. James street. It is expected that the work of erecting the new building will be commenced on May 1st, when the lease on the present property expires. J. C. Broderick, National Trust Building, architect. (Previously mentioned.)

The premises occupied by J. H. Waldman & Company, St. Paul street, were destroyed by fire on the 2nd inst. Estimated loss, $100,000.

Messrs. MacDuff & Lemieux, architects, Merchants' Bank Building, are preparing plans and specifications for office fixtures for the Mark Workman Company.

Plans and specifications are being prepared for alterations to two stores and dwellings at the corner of Marie Anne and Breboeuf streets, for Mr. F. L. de Martigny. MacDuff & Lemieux, architects, Merchants' Bank Building.

New Liskeard, Ont.

Mr. Weatherup is negotiating with the council for the location of a flour mill here to cost, exclusive of elevators, $25,000.

Ottawa, Ont.

Dr. Baird has purchased property on Queen street, east of Bank, where he will erect, it is stated, a four storey building.

Tenders will be received until April 9th, for the installation of plumbing, heating and ventilating systems, electric light, power and telephone wiring, elevators and vacuum cleaning system in the Union Station, Ottawa. Messrs. Ross & Macfarlane, architects, 1 Belmont street, Montreal, Que.

Tenders will be received at an early date for the installation of plumbing, heating and ventilating systems; electric light, power and telephone wiring, elevators and vacuum cleaning system; in the Chateau Laurier, Ottawa. Ross & Macfarlane, architects, 1 Belmont street, Montreal.

Port Arthur, Ont.

George Arthurs' garage was burned on the 28th ulto. Total loss about $5,000.

Portage la Prairie, Man.

Plans have been prepared for a new addition to the Bank of Commerce building in this city and the work will be pushed ahead without delay. Estimated expenditure, $10,000.

Rosthern, Sask.

The Dominion elevator was destroyed by fire on the 30th ulto. Estimated total loss $7,200.

Stratford, Ont.

The mills owned by Duftons, Limited, were almost totally destroyed by fire on the 3rd inst. Total estimated loss, $50,000.

St. Thomas, Ont.

The ratepayers will shortly vote on a bylaw to raise $15,000 as a loan to A. E. Metcalf, who is considering the erection of a shoe manufactory.

St. Catharines, Ont.

The buildings occupied by the Peerless Cash Register Company was destroyed by fire recently. Estimated total loss, about $8,000.

Sault Ste. Marie, Ont.

It is reported that the Lake Superior Steel Corporation have plans for the enlargement of the works, which will call for an expenditure of approximately $6,000,000, while extensions of the Algoma Central Railway, which is owned by the corporation, are being planned, to cost nearly $5,000,000. The Dominion Tar Company, capitalized at $100,000, has, according to Mr. Fawcett, member of the local Board of Trade, purchased seven acres of land from the Lake Superior Power Company, and will erect a plant for the manufacture of coal tar from the by-products of the coke ovens.

Three Rivers, Que.

J. A. Tessier, M.L.A., will present a bill to the legislature asking for the authorization to borrow $200,000 to aid in the rebuilding of this city.

Thessalon, Ont.

It is stated that the C. P. R. will spend $40,000 on a new station and yard at this point in June.

Toronto, Ont.

A permit for the erection of the new Union Bank, southeast corner of Bay and King streets, has been issued by the city architect. The building will be five storeys in height, and will be of fireproof construction, steel, brick and concrete. Cost, $150,000.

A building permit has been issued to Canada Veiling Company, for a six storey, brick and steel warehouse, 84-86 Wellington street west, $76,000; also to A. Kent & Sons Company for a ten storey brick and steel office building, 156 Yonge street, $150,000.

Vancouver, B.C.

The Fraser River Lumber Mills announce plans for extending its plant at Millside this summer at a cost of $250,000.

Victoria, B.C.

W. N. Mitchell, 242 Gorge road, has purchased property east of Douglas street, where he will erect three stores shortly.

J. Valo, 313 Broad street, will build a two storey block at Government and Bay streets, cost, $10,000; Sweeney & McConnell, Langley street, will build on the lot next the B. C. Electric Company's offices, cost $15,000.

Architect G. E. Watkins has practically completed plans for the five storey structure on Fort street between Douglas and Blanchard, for J. S. Bowker. It is expected that they will be approved in a few days, when tenders will be invited and the work proceeded with.

Windsor, Ont.

The new industrial bylaw in Windsor, which provided for the setting aside of $20,000 for the purchase of 40,000 acres of land for factory sites, will be voted on by the citizens on May 2nd.

Winnipeg, Man.

It is the intention of Stobart & Company, King and McDermot streets, to erect a three storey addition, occupying the entire property, during the present season. The foundations will be put in to carry at least seven storeys, to which height it will be carried next year. Estimated expenditure, $60,000. Plans will be definitely arranged on Mr. Stobart's return from England in June.

Tenders will be received until April 9th by Wm. Fingland, architect, 334 Portage avenue, for branch building for the Bank of Hamilton, at Swan Lake and Roland, Man. Plans, etc., at the above mentioned branches and at the office of the above.

Yorkton, Sask.

At a special meeting of the board of trade, the Yorkton, Forwarding & Storage Company, capitalized at $10,000, was organized, and work of erecting a large, wholesale storage warehouse for wholesalers will be begun immediately.

AWARDED.

Montreal, Que.

The contract for electric lighting fixtures for the Bank of Montreal Building in St. Johns, Newfoundland, has been awarded to the Garth Company, 26 Craig street west, Montreal. Messrs. Peden & McLaren, architects, 20 St. Alexis street.

The contract for wood finishing in connection with alterations to new offices for Messrs. Hanson Bros. in the Liverpool, London & Globe Building, has been awarded to Thos. Ford. Mr. C. Dufort, architect, La Patrie Building.

The contract for the construction of the new Windsor street station viaduct has been awarded to the [illegible] Construction Company. W. S. Painter, C. P. R. architect.

Orillia, Ont.

The Expanded Metal & Fireproofing Company of Toronto, have the contract to supply material for reinforcing concrete work and steel "Fireproof" [illegible] in the factory being erected by the [illegible] Manufacturing Company. Estimated cost, $7,000.

Stratford, Ont.

Messrs. Swift & Company have awarded the contract for the construction of their storage plant to John L. Youngs.

Winnipeg, Man.

Jas. McDiarmid & Company have been awarded the contract to construct the planing mill at the C. P. R. shops here.

Power Plants, Electricity and Telephones

Berlin, Ont.

Property owners to-day carried two bylaws one to take $60,000 worth of stock in the People's Railway Company, and the other to grant certain franchises to the company along the public streets.

Brandon, Man.

City Engineer Speakman has prepared plans for the establishment of a steam generating plant, capable of furnishing sufficient power to operate a street railway, the pumping station and street lighting, and save about 300 horse power in reserve. A public steam heating system would also be served. Estimated cost $125,000.

Brockville, Ont.

It has been decided to submit a bylaw to the ratepayers on April 25th, providing for an expenditure of $50,000 to amalgamate light and water plants.

Calgary, Alta.

The commissioners have recommended that a bylaw to raise $125,000 for the proposed municipal electric power plant, be submitted to the ratepayers. City Engineer Childs has completed plans.

An estimate of the amount that will be required for electric light extensions has just been prepared by Commissioner Graves, and includes: 86,074 pounds weatherproof wire at 18 and 20 cents, $15,593.32; 550 poles, various sizes, $2,169; 2,600 cross arms, various sizes, $920; machine and carriage bolts, washers, wood screws, nails, guy wire and clamps, cross arm braces, fuse wire and plugs, rubber-covered wire, porcelain tubes, top pins, D. P. insulator, lamp sockets, pole steps, sundries, $5,621.27; meters, various sizes, $12,000; transformers, various sizes, $10,280; 100 arc lamps and station transformers and equipment, $7,000. Total $70,000.

Edmonton, Alta.

The citizens will vote on April 21st on a bylaw to issue $30,000 debentures for the purpose of extending and improving the municipal electric system; also on the same date on a bylaw to issue $60,000 debentures for the purpose of erecting, etc., car barns for the municipal street railway system; also on the same date a bylaw to issue $260,500 debentures to extend and further [illegible] system.

London, Ont.

Mr. M. A. Soper, representing Smith, Kerry & Chace, consulting engineers, Toronto, has been looking over the proposed line of the London & South Western Railway, with which it is planned to connect London with [illegible]. The [illegible] a report to the promoters.

Montreal, Que.

[illegible] intention to extend the road considerably. A large amount of money will also be expended in [illegible] the power plants. Ross & Holgate, consulting engineers.

Moose Jaw, Sask.

The ratepayers will vote on April 19th on the question of street railway franchise. W. F. Heal city clerk. Noted in last issue.

It is reported that a syndicate consisting of A. A. Dion, Ottawa; Jas. T. Cashman, Moose Jaw, and others, came to an agreement with the corporation on the 26th ulto., whereby the syndicate undertakes to build three miles of street railway this summer and three miles next summer, receiving an exclusive franchise for twenty years. It is estimated that the initial cost will be $175,000. Noted in last issue.

New Westminster, B.C.

Extensive improvements are contemplated to the plant of the Mission Telepnone Company.

Report has it that the B. C. E. R. Company has purchased fifty acres adjoining the Fraser river bridge at New Westminster for tram freight yards purposes.

Port Renfrew, B.C.

Peterborough, Ont.

The Canadian General Electric Company, through General Manager Mr. F. Nicholls, has submitted to the Mayor, the following offer for the surplus power at the new waterworks dam: To build and equip a power house, operate and maintain the same, and pay the sum of $2,000 annually to the city, on the understanding that not less than 1,000 horse power will be available; at the expiration of the 20-year term the power house and equipment to revert to the city without cost; the company to spend not less than $250,000 on improvements and extensions.

Renfrew, Ont.

In order to raise money for the development of the water powers, a bylaw will be submitted to the ratepayers for $77,000.

Stratford, Ont.

The Bell Telephone Company proposes to erect a new office building at a cost of $50,000.

On April 14th, the ratepayers will vote on a bylaw to provide $85,000 for a distribution plant for Niagara power.

St. Thomas, Ont.

City Engineer Bell advises the ratepayers to vote on the improvement to city railway on the date they vote on park improvements.

Victoria, B.C.

The West Coast Power Company, Limited, is making application for a water record of 3,500 feet per second on Gordon river, Vancouver Island, just below the Big Canyon. It is calculated that 110,000 horse power can be developed with this amount of flow and with a 300-foot head. It is stated the works will occupy an area of 100 acres.

Vancouver, B.C.

The construction of the new wing of the British Columbia Telephone Company's building in Seymour street, will be begun at once by Messrs. Smith & [illegible] from designs prepared by Mr. Cox.

Tenders will be received until April 15th for the supplying and erecting of poles for the B. C. Telephone Company, Limited. Plans, etc., at [illegible] and this city.

Winnipeg, Man.

[illegible]

(Continued on page [illegible])

Tenders and For Sale Department

The City of Calgary

Tenders will be received by the City Commissioners up to and including APRIL 22ND, 1910, at 4 o'clock p.m., for supplying the City of Calgary with the following material:

Salt Glazed Vitrified Clay Sewer Pipe, according to specifications to be furnished by the City Engineer. Tender to state price, f.o.b. Calgary.

A marked cheque for $100 to accompany each tender.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary March 17th, 1910. 16

TOWN OF DUNNVILLE

Province of Ontario

Notice to Contractors

Sealed tenders will be received by the Town Clerk until 8 p.m. on TUESDAY, APRIL 19TH, 1910, for the following works:

(a) For constructing Sewage Pumping Station.

(b) 3,000 feet of wrought iron pipe, and brass valves.

(c) Laying of the above for Compressed Air Line.

(d) Air Compressors.

(e) 400 manhole steps.

No tender necessarily accepted.

ROBT. BENNET, ESQ., Mayor, Dunnville, Ont.

J. W. HOLMES, ESQ., Town Clerk, Dunnville, Ont.

WILLIS CHIPMAN,
Chief Engineer, Toronto, Ont.
14

County of Victoria

Tenders for

Steel Bridge Spans

Tenders, so marked, will be received by the undersigned until WEDNESDAY, APRIL 13TH, 1910, for the supply and erection of two (2) Steel Bridge Spans of sixty (60) feet each over all for a bridge in two parts separated by a fill of about 100 feet, across Little Bob River, near the Village of Bobcaygeon.

The spans are to be of sufficient width to provide a clear fourteen (14) feet roadway, unobstructed, to be constructed for the reception of a concrete floor and in all respects to conform to the Ontario Government specifications, 1909.

The tenders are to include the supply of wire bonding for the concrete floor, of corrugated steel and of approved strength.

Tenderers are to furnish with their tenders plans of the spans, with all requisite details, and certified by the Department of Public Works of Ontario.

Further particulars on application.

No tender necessarily accepted.

J. R. McNEILLIE,
County Clerk.

Lindsay, March 26th, 1910. 14

YORKTON, SASK.

Tenders for Concrete Sidewalk

Tenders will be received by the Secretary-Treasurer of the Town of Yorkton, Sask., until MONDAY, APRIL 25TH, 1910, for the furnishing of all material and the construction of approximately 80,000 square feet of concrete sidewalk. Particulars may be had on application to the Town Engineer. A marked cheque for $300 to accompany each tender. Lowest or any tender not necessarily accepted.

F. T. McARTHUR, B.Sc.,
Town Engineer.

15.

The City of Calgary

Tenders will be received by the Commissioners of the City of Calgary up to and including the 22ND DAY OF APRIL, 1910, at 4 o'clock p.m., for the construction of the following works, according to plans and specifications to be furnished by the City Engineer:

Five miles of sewer, inculding pipe,

Three miles of water mains, city supplying pipe.

A marked cheque for $500 to accompany each tender.

A bond of maintenance for one year signed by a satisfactory surety company to be delivered when work is completed.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary, 17th March, 1910. 16

Township of East Zorra

Tenders Wanted

Tenders will be received by the undersigned up to 3 o'clock p.m., of MONDAY, APRIL 11TH, 1910, for the erection of a Steel Bridge and Concrete Abutments therefor, in the Township of East Zorra, Oxford County, Ont., bridge to be 70 feet long over all and 14 feet clear width, with concrete reinforced floor, and guaranteed to carry a moving load of 15 tons. Tenderers to furnish plan and short specification of proposed work and may offer for the whole work, or for erected bridge, or for abutments, or for floor only. For further particulars apply to

JAMES ANDERSON,
Clerk, East Zorra,
Hickson P.O., Ont,

14

Plant for Sale

For Sale:—The following Second-Hand Plant, located at Durham, Ont., or portion theerof. The whole lot at a reduced price,

25 No. 3 American, square pan, wooden hub, Wheel Scrapers.

28 No. 3 K. & J., round pan, iron hub, Wheel Scrapers.

6 No. 3 Western, square pan, with doors, Wheel Scrapers.

7 No. 2, K &J, round pan, iron hub improved, Wheel Scrapers.

55 Doors and Gates, for No. 3 Wheel Scrapers.

27 Slush Scrapers.

15 Light and Heavy Plows.

Located at Three Rivers, Que.

One Large Travelling Clam Shell Derrick.

One Steam Pile Hammer (Cram Patent), with Steam Hose.

One Thomas Automobile (Model 31), 60 h.p., thoroughly overhauled and painted; location, Toronto.

THE RANDOLPH MACDONALD CO., LIMITED,
14 Crown Life Building, Toronto, Ont.

EXTENSION OF TIME

Tenders for

Gas Franchise

Bids, sealed and endorsed "Gas Franchise," will be received by the City Clerk of the Corporation of the City of Fort William, up to APRIL 11TH, 1910, for the letting of a Gas Franchise, including construction of Plant, Mains, etc., and operation,

Conditions, specifications and form of tender, on which bids must be submitted, can be obtained from the undersigned. Lowest or any tender not necessarily accepted.

JOHN WILSON,
Assistant City Engineer,
Fort William, Ont.

14.

Town of Weston

Province of Ontario

Water Works

Sealed tenders will be received by the Village Clerk until 8 p.m. on MONDAY, APRIL 18TH, 1910, for the following works:—

Contract "B"—Pump House.

Contract "F"—Mechanical Water Filters.

Contract "G"—Electrically Operated Pumping Machinery.

Plans and specifications may be seen at the office of the Chief Engineer, Mail Building, Toronto, or at the Town Hall, Weston.

R. J. BULL, Esq., Mayor, Weston, Ont.

J. H. TAYLOR, Esq. Clerk, Weston, Ont.

WILLIS CHIPMAN Chief Engineer,
204 Mail Building, Toronto, Ont.

14

Positions Vacant

WANTED.—ARCHITECTURAL DRAFTSMAN, good all-round man. Steady employment if services prove satisfactory. Send references, state experience and salary wanted. Address Box 953, Contract Record, Toronto. 15

Positions Wanted

CONCRETE WORK.—A good man, well up in the business, thoroughly understands plans, handling men and getting results, and a hustler, is open for a change, or would take contract, any town. Box 949, Contract Record, Toronto. 14

Miscellaneous

WANTED TO FORM PARTNERSHIP with a practical contractor, or one who wishes to enlarge and needs more financial assistance. Apply Box 952 Contract Record, Toronto. 14

GOOD SECOND HAND HYDRAULIC HOIST complete, capacity 2½ tons. For sale, very cheap. Apply to R. J. Dodds, 16 King street east, Toronto, Ont. 15

PLANT FOR SALE

One No. 3 Gates crusher, complete.
Three revolving stone screens.
110 elevator buckets.
One 70 h.p. Loco fire box boiler.
One 30 h.p. Loco fire box boiler, on wheels.
One 25 h.p. Loco fire box boiler, on skids.
One 12 h.p. ''Champion'' boiler and engine.
One single drum Buffalo horse power.
One double drum horse power.
26 pairs 18-inch car wheels with axles, 3-foot 6-inch guage, with boxings.
A lot of derrick castings and irons.
Wire guys.
One piece of shaft, 3 7-16 inch by 13 feet 9 inches.
One piece of shaft, 2 15-16 inch by 12 feet.
Some belt pulleys.

J. C. INGLES,
16. Hagersville, Ont.

Tenders for

72 INCH STEEL PIPE

Public notice is hereby given that the time for receiving tenders for a supply of 72-inch Rivetted Steel Pipe, in connection with the proposed extension to the waterworks intake for the City of Toronto is extended from Tuesday, April 5th, 1910, to Friday, April 15th, 1910.

Tenders are to be sent by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, and must be mailed not later than 12 o'clock noon on the said FRIDAY, APRIL 15TH, 1910.

G. R. GEARY, (Mayor),
Chairman, Board of Control.

City Hall, Toronto, April 1st, 1910. 11

Power Plants, Electricity and Telephones

(Continued from page 29)

luminous arc lamps, also regulators and switchboards, at a cost of $17,000.

We are informed that the report concerning the tender of the Manitoba Bridge & Iron Works for wire fencing is incorrect. The firm in question do not tender on the erection of wire fences.

AWARDED.

St. Thomas, Ont.

Contract for installing a booster and additional cells in the present storage battery, as well as overhauling the battery for the Niagara power system, has been awarded to the Lancashire Dynamo Company, of Manchester, England, and Toronto, Canada, at $3,499. The next lowest tenderer was the Canadian Westinghouse Company at $3,780. Contracts for cross arms and pins were awarded to F. Bissell & Company, Toledo, and for braces to the Canadian General Electric Company. The tenders for poles were not complete and the chairman and [illegible] to accept the lowest or best tender.

Miscellaneous

Cornwall, Ont.

Tenders will be received until April [illegible] for improvement to Lock [illegible] canal. A. W. Campbell, chief engineer, Department of [illegible] Ottawa; C. D. Sargent, resident engineer, Ontario St. Lawrence Canals, Cornwall.

Hull, Que.

The council have decided to call for tenders for house numbers and street names.

Montreal, Que.

Recent building permits include: Wall Bros., 224 Forsyth street, residence, $2,000; D. Chapleau, 2445 Waverley street, house containing four dwellings, $4,000; Tabernacle Baptist Church, building, $8,000; J. R. Gardiner, architect; G. Barham, Notre Dame street, dwelling, $3,000; Louis Lachaine, St. Phillip street, house containing three dwellings, $2,000; L. Dalbec, 287 Garnier street, house containing four dwellings $3,000; A. White, 220 Liverpool street, house containing two dwellings, $3,500; Mrs. Rochon, Esplanade avenue, house containing three dwellings, $5,000; Mrs. L. Fortine, 974 Catherine street east, four houses containing twelve dwellings, $10,000; F. Jubenville, 2200 Waverley street, house containing three dwellings, $4,000; L. Beaubien, 1703 Labelle street, house containing three dwellings, $2,000; Charles Casey, 103 City Councillor street, six dwellings, $11,000; E. St. Pierre, 965 St. Antoine street, house containing six dwellings, $4,000; E. Giasson 13 Langevin street, two houses, $11,000; Jos. Savage, 211 St. Ferdinand street, house containing two dwellings, $5,000; A. Gohier, 6 Parc Lafontaine, two houses, $5,000; D. Plouffe, 12 Boucher street, three dwellings, $3,000; C. Rosenburg, 3 Ontario street east, store, $50,000; A. Brillion, 1185 St. Denis street, house containing three dwellings, $9,000; O. Lafrance, 206 Berri street, house containing two dwellings, cost $2,000; M. Leclaire, 2649 St. Hubert, two houses containing six dwellings, $5,000; R. Abraham, 33 Laval avenue, alterations to store, $4,700; Daouse & Lalonde, 42 Victoria Square, alterations to building, $2,000; Z. Gras, 532 Beaudry street, two dwellings, $2,000; J. Boucher, 305 Sanguinet street, house, $3,000; G. Drinkwater, 333 Peel, alterations to dwelling, $2,000; J. Wiliski, 6 Montgomery street, two stores and four dwellings, $65,000; C. Perrault, 152 Sanguinet street, two stores and four dwellings, $8,000; L. Clement, 1290 St. Hubert, house containing nine dwellings, $10,000.

Ottawa, Ont.

The Department of Public Works at Ottawa is asking for tenders, to be received until Tuesday, April 19th, for dredging at various places in the province of Quebec.

Tenders for the construction of a steel steamer for the quarantine service will be received until May 31st. Plans, etc., upon application to Department of Agriculture. A. L. Jarvis, assistant deputy minister.

The building permits issued recently include an iron-clad factory, 200 by 60 feet, at the end of MacKay street, to be erected by Mr. R. A. Sproule, $7,000; J. H. Ashfield, brick veneer dwelling, Oakland avenue, $2,500; S. J. Willoughby, brick veneer dwelling, James street, $3,500; J. E. Meister, brick veneer dwelling, Concord street, 2,000; A. Loreque, double brick veneer dwelling, [illegible] H. Craig and T. M. Mulligan, two solid brick dwellings, Woodlawn avenue, $3,000 each; V. S. Bartram, brick veneer dwellings, four [illegible] Ahearn, brick veneer dwelling and shop, Arthur street, $3,500; E. R. McNeil, double brick veneer dwelling, Centre street, $4,-[illegible] Hopewell, brick veneer dwelling, Spruce [illegible] $3,500; F. W. Mahon, brick veneer dwellings, five in row, Sterling avenue, $5,000; A. Gauthier, brick veneer dwelling, Clarence street, $2,500; M. Parent and P. Aubry, brick veneer dwelling, Bolton street, $2,500; Mrs. T. O'Connor, brick veneer dwelling, Water street, $2,900; Jas. Morrison, brick veneer dwelling, Arlington avenue, $2,500; Noe Gauthier, brick veneer shop and dwelling, Somerset street, $2,500. Arcade, alterations and two additional storeys, on Queen street, to be used as shops, estimated cost 16,500; Fred Hunt, brick veneer dwelling Pine street, $3,600; J. R. McLennan, brick warehouse and shop Lisgar street, $2,500; Chas. Rupert, brick veneer dwellings, six in row, Percy street, $9,000; A. A. Fournier, brick addition to apartments on Lyon street $2,000; Norman Mulligan, thre brick veneer dwellings on Concord avenue, $3,000; F. W. Wilson, two brick veneer dwellings, Gordon street, 3,500; Thos. Guthrie, brick veneer dwelling, Second avenue, $2,500; Rev. Father Conrad, brick veneer meeting hall, Melrose avenue, $3,500; C. G. Horwood, two brick veneer dwellings, Rosedale avenue, 3,000 each; A. Tracy, double brick veneer dwelling, Preston street, $3,500; D. O'Connor, Sr., alterations to store, Sparks street, $4,500; F. H. Cuff, row of four brick veneer dwellings, Gladstone avenue, $5,000; Emerie Gauvreau, row of six brick veneer dwellings, St. Andrew street, $5,300; Mrs. Ruggles Wright, solid brick dwelling, Carter street, $6,000; R. Lunt and C. Nash, brick veneer dwelling, Sunnyside avenue, $2,500; R. McGregor, ironclad machine shop, Queen west, $2,000; J. W. Nimmo, two brick veneer dwellings, Carling acenue, $3,500 each; J. W. Nimmo, brick veneer dwelling, Carling avenue, $3,800; Miss Laura Hickey, row of four brick veneer dwellings, Stratneona avenue, $5,000; J. R. Irvin and Mrs. E. Irvin, three dwellings, Bell street, $2,000; J. Alexander, brick veneer dwelling, McLeod street, 2,500. St. Germain & Fraas, brick veneer dwelling, Carling avenue, $4,000; F. L. Campbell, double brick veneer dwelling, Nelson street, $4,000; T. J. Somerville, double brick veneer dwelling, Harvey street, $2,000; G. Tomlinson, brick veneer dwelling, Carling avenue, $4,200; Oblate fathers, finishing interior of church, Laurier avenue east, $23,000; Seybold & Gibson, alterations to Central chambers, $10,000; Henry Allan, brick veneer dwelling, Greenfield avenue, $1,800; Chas. Crab, brick veneer dwelling, Center street, $3,000; J. P. Ferguson, brick veneer dwelling, Powell avenue, $5,000; John E. Wilson brick veneer dwelling, Spadina avenue, $2,000; James Davidson, brick veneer apartment house, Albert street, $6,000; Davir Bigg, brick veneer dwelling, Florence street, $2,500; H. A. Leach, brick veneer dwelling, Thornton street, $2,200; S. Miller and D. E. Epstein, addition and alterations to shop and dwelling, Elgin street, $5,000; W. Shenkman, brick veneer and iron-clad dwellings, three in a row, Rideau street, $3,500; shop, Murray street, $2,200; Louis F. Tradbuks, brick veneer dwellings, five in row, Cobourg street, $4,500; Ottawa Car Company Limited, [illegible] Albert street, $3,000; James Davidson, brick veneer dwellings, fourteen in row, Goulbourn avenue, [illegible] ings, Carruthers avenue, $1,500; T. Lavigne, brick veneer dwellings, three in row, Armstrong street $4,000; R. A. Kemp, brick veneer dwelling, Thornton street, $2,200; Bryson, Graham, Limited, addition to warehouse, Queen street, $2,500.

Sudbury, Ont.

Tenders will be received until April 11th [illegible]

[illegible] local improvement debentures, $4,[illegible], 10 years, 5 per cent.; local improvement debentures, [illegible], 10 years, 5 per cent. [illegible], [illegible].

Toronto, Ont.

Recent building permits include: James [illegible], att. [illegible] brick dwellings, Ossington avenue, $[illegible]; R. P. Allen, 2 det. 2-sty. brick dwellings, McLean, $6,000; R. L. [illegible], pr. semi-det. 2-sty. brick stores & dwellings, $[illegible]; W. F. McCutcheon, pr. semi-det. and 3 det. 2-sty. brick dwellings, [illegible], $[illegible]; W. H. Price, 2-sty. and attic brick dwelling, Palmerston Blvd., $9,000; E. P. Atkinson, pr. semi-det. 2-sty. brick dwellings, Roncesvalles, $5,500; A. R. Williamson, 3-sty. brick addition to apartments, [illegible] avenue, $10,000; Dundas Building Co., 3 att. 2-sty. brick dwellings, Fairview, $5,500; Lankin Bros., 2 pr. semi-det. 2-sty. roughcast dwellings, brick fronts, Frizzell, $6,000; A. Dyce, 2 det. 2½ storey brick dwellings, near Sunnyside, on Geoffrey, $7,000; W. G. Cox, 2-sty. brick dwelling, Fernbank, $5,000; D. Tugendhaft, 2½-sty. brick dwellings, 4 det., corner Indian road and Geoffrey, $13,500; R. Ewing, 2 det. 2½-sty. brick dwellings, Thorold, $6,000; R. M. Mackey, 2 det. 2-sty. and attic brick dweling, Conduit, $7,000; W. W. Wilson, 2 det. 2-sty. and attic brick dwellings, Wineva, $6,000; J. H. Young, 2 pr. semi-det. 2-sty. 2-sty. brick dwellings, corner St. Vincent and St. Albans, $8,000; Watkinson & Marr, 3 att. 2-sty. brick dwellings, O'Hara, $8,000; A. R. Thompson, 2 det. 2½-sty. brick dwellings, Algonquin, $6,000; J. W. Devittt, 2 pr. semi-det. 2-sty. and attic, brick dwellings, corner Barton and Markham, $10,000; A. B. Brown, 3 pr. semi-det. 2½-sty. brick dwelling, Woodlawn, $21,000; A. B. Brown, 2 pr. semi-det. 2½-sty.. brick dwellings, Woodlawn, $14,000; J. H. Stanford, 2 pr. semi-detached brick dwellings, Bathurst, $11,000; J. J. McCarthy, alt. and add. to hotel, corner Richmond and Church, $15,000; A. T. Stewart, 6 det. 2½-sty. brick dwellings, corner Sunnyside and Constance, $14,500; A. Stephens, 2 det. 2½-storey brick dwellings, Geoffrey, $7,000; H. H. Love, 2½-sty. brick dwelling, Wychwood Park, $13,000; H. Greensides, 3 att. 2-sty. brick dwellings, 982-4-6 Ossington avenue, $6,000; Mrs. M. Kent, 2½lsty. brick dwelling, Walmer road hill, $6,000; Allen Bros., 3 att. 2 sty. brick dwellings, Delaware avenue, $6,000; F. J. Cumings, 2 pr. semi-det. 2-sty. brick dwellings, Western avenue, $9,000; W. E. Groves, pr. semi-det. 2½-sty. brick dwellings, North Major, $8,00; City Dairy Co., 3-sty. brick and steel factory, Spadina Crescent, $25,000; Mrs. M. L. Kent, 2½-sty. brick dwelling, Dunvegan road, $7,000; Jas. Burford, 2 pr. 2½-sty. brick dwellings, Wells street, $14,000; A. W. Pike, 2 pr. semi-det. 2-sty. brick dwellings, Gladstone, $8,000; J. J. Downey, 3 att. 2-sty. brick dwellings, Lansdowne, $6,000; H. B. Clark, 4 att. 2-sty. brick stores and dwellings, Bloor west, $10,000; W. A. Hart, Jr., 3-sty. brick apartments, King west, $25,000; H. E. Simpson Co., pr. semi-det. 2½-sty. brick dwellings, corner Virtue and Sorauren, $5,800; H. Gramblett, 2 pr. semi-det. 2-sty. brick dwellings, North Keele street, $8,000; B. H. Fraser, 3 pr. semi-det. 2-sty. brick dwellings, Logan avenue, $12,000; J. T. & H. Hutson, pr. semi-det. 2-sty. and attic brick dwellings, corner De Lisle and Deer Park crescent, $8,000; Wm. Hodgkinson, 4 pr. semi-det. 2-sty. R. C. dwelling, brick fronts, Booth, $14,000; Geo. Birdsall, 3 detached 2½-sty. brick dwellings, corner Walter and Indian road, $10,000; Harris & Lee, pr. semi-det. 2½-sty. brick dwellings, Marmaduke, $6,000; Jos. Lavvie, pr. semi-det. 2-sty. brick dwellings, Howard Park avenue, $5,000.

Vancouver, B.C.

Recent building permits are as follows: Vancouver Ice & Cold Storage Company, Gore avenue, $65,000; J. B. Mathers, Eighth and Westminster avenue, $30,000; British Columbia Telephone Company, Seymour street, $20,00; Vancouver Breweries, Seventh avenue, $10,000; H. D. Crawford, 1702 Park drive, $13,000; Timberly & Huxtable, Seventh avenue west, two houses, $5,000; E. Bellhouse, 1912 Seventh avenue west, $2,000; J. C. Halswell, 1857 Gravely street, $2,350; A. Knight, 2845 Spruce street, $4,000.

Victoria, B.C.

Permits were issued recently by the building inspetcor to the Michigan-Puget Sound Lumber Company for a dry kiln on Constance street to cost $2,000, and for a store house on Store street, to cost $3,000; G. W. Cramer, for a dwelling on Work street, to cost $3,300.

Winnipeg, Man.

Property to the extent of 10,000 feet frontage in Transcona, near G. T. P. shops, has been sold through W. J. Christie & Company to two contractors of Rivers, Man., who will erect buildings in accordance with the demand.

Among the permits issued recently are the following: J. Isenberg, five houses, on south side of Fleet street, between Hugo and Helen, $12,500; A. Simmons, dwelling, north side of Grosvenor, between Guelph and Wilton, $5,500; D. G. Kenny, dwelling on Rosedale, between Pembina and Nassau, $2,800; A. H. Alinger, house, north side Ruskin Row, between Park road and Kingsway, $7,000; M. Simon, house, south side of Bannerman, between Andrews and Powers, $2,000; J. C. Hocks, two houses, north side McMillan, between Aynsley and Helen, $4,000 each; Cooper and Whitlaw, two dwellings, north side of Cathedral, between Charles and Aikins, $2,000 each; D. Bleve, house, east side Newman, between Portage and Ida, $2,000; S. Henkel, two dwellings, east side Alverstone, between Yarwood and Wellington, $4,400; J. B. Duncan, dwelling, Grosvenor, between Stafford and Harrow, $3,800; H. Smith, dwelling, Pritchard, between McKenzie and Parr, $2,800; D. Neilson, dwelling, Arlington, between Bath and Ida, $2,800; Arni Eggertson, dwelling, Agnes, between Sargent and Wellington, $6,000; W. Webster, dwelling, Arlington, between Ida and Bath, $2,700; George Maskel, dwelling, Alverstone street, between Notre Dame and Yarwood, $3,000; R. Ward, dwelling, Matheson avenue, between Main and Norman, $2,500; W. J. Lowden, dwelling, Polson, between Main and Mac, $2,500; Lance Hall, dwelling, Banning street, between Einarson and Livinia, $2,300.

AWARDED.

Moose Jaw, Sask.

The contract for the supply of two 2-horse street sprinklers has been awarded to Moose Jaw Machine Works, Limited, for $139.40, for the two.

The B. C. Gazette gives notice of the incorporation of the following companies:—The T. L. Peck Company, Limited, capital $70,000, incorporated to construct and operate electric works; West Coast Power Company, Limited, capital $10,000; Slocan Lake Lumber Company, Limited, capital $100,000; the Port Haney Water Works Company, Limited, capital $10,000; Ward Electric Company, Limited, capital $10,000.

New Companies

Manitoba Land and Timber Company, Limited, Montreal, Que, incorporated, capital 400,000. Incorporators, Geo. Vipond Cousins, accountant, and Patrick Francis Brown, clerk, Montreal, Que.

The Crossen Car Company, Cobourg, Ont., incorporated, capital $1,000,000, incorporated to carry on business as contractors, also lumber manufacturing. Incorporators, Alexander Falconer, advocate, Westmount, Que., and Benjamin Ginsberg, Montreal, Que.

The Canadian Boving Company, Ottawa, Ont., incorporated to carry on a general contracting and construction business. Capital, $20,000. Incorporators, Jens Orten-Boving, London, Eng., hydraulic engineer, and James Goodwin Gibson, barrister.

The Canadian Domestic Engineering Company, Limited, Montreal, Que., incorporated, capital $45,000. Incorporators, R. Taschereau, K.C., and Jos. Emile Billette, both of Montreal, Que.

Northern Construction Company, Limited, Winnipeg, Man., incorporated, capital $200,000.

Modern Raiway Device Manufacturing Company, Montreal, Que., incorporated, capital, $1,500,000. Incorporators, Wm. Elilott Hamilton, dealer in railway and contractor's supplies, and Henry Reid Emmerson, mechanical engineer, both of Montreal, Que.

Gas and Electric Appliances, Limited, Ottawa, Ont., incorporated, capital $50,000. Incorporators, Herman Henry Pitts, manufacturer, and Gordon McLeod Pitts, civil engineer, both of Montreal, Que.

The Talbot-Allard Lumber Company, Limited, incorporated, capital $300,000. Incorporators, Wilfrid Talbot and Uldoric Allard, of Courcelle, Que.

The Western Electric & Supply Company, Limited, Fort William, Ont., capital $40,000. Incorporators, H. James, C. D. Milner, accountants; Sterling Jaffray, electrician, all of Fort William, Ont.

Bell & Rochester Hardware Company, Limited, Haileybury, Ont., incorporated, capital $50,000. Incorporators, E. A. Wright and E. W. Kearney, barristers, both of Haileybury, Ont.

The Home Builders, Limited, Toronto, Ont., incorporated, capital $40,000. Incorporators, W. H. Price, C. M. Garvey, solicitors, and J. A. Mitchell, contractor, all of Toronto, Ont.

The John Carew Lumber Company, Limited, Lindsay, Ont., capital, $200,000. Incorporators, John Carew, and F. J. Carew, lumbermen, both of Lindsay, Ont.

National Timber and Pulp Company, Limited, Toronto, Ont., capital $500,000. Incorporators, William Percy Gillespie, broker, Toronto, Ont.; Hubert C. French, contractor, Winnipeg, Man., and Ivers P. Lawrence, wholesale lumberman, Fritchburg, Mass., U. S. A.

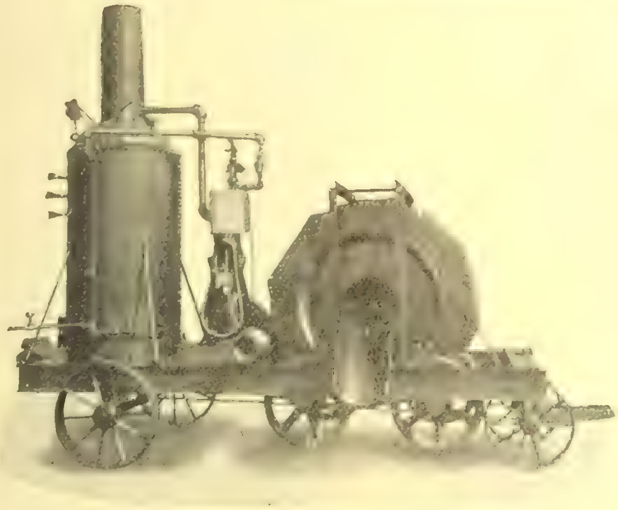
Western Lumber Company, Limited, Toronto, Ont. Incorporators, Gerard Godfrey Ruel and Geo. Frederick Macdonnell, barristers-at-law, Toronto, Ont.

Owen Sound Lumber Company, Limited, Owen Sound, Ont., capital $50,000. Incorporators, Harry Edgar Rowland and John Morris Rowland, lumber merchants, Owen Sound, Ont.

National Glass, Limited, Montreal, Que., capital, $45,000, incorporated to manufacture, import, etc., glass, paints, varnishes, etc. Incorporators, J O. Dubois, St. Chrysotome; L. A. Cadieux, Montreal, Que.

HADSEL

A mixer combining all the advantages of a continuous and is a batch mixer



The loading hopper on our one-half yard mixer has a capacity of one half-yard of **unmixed material.**

A strong feature. The gate between hopper and mixer is so arranged that while one batch is being mixed and discharged the laborers are busy filling the hopper.

When the mixing batch is discharged the engineer pulls gate allowing unmixed batch to run into mixer and then closes gate, immediately permitting reloading of hopper to proceed almost uninterruptedly.

ROGERS SUPPLY COMPANY

Phone Main 4155

Head Office: 3 King Street East, Toronto

Creosoted Wood Paving Blocks

cut from the log in our own mills out of live Douglas Fir and creosoted to specification as to Oil and Pressure. Capacity 1,000 yards per day.

Bridge, Structural and Mining Timbers

cut and sized to exact dimensions, and if so desired, framed in our yards before Creosoting.

Standard Creosoted Railroad Ties

Dominion Carbolineum Works Limited

Vancouver, B. C.

Smith Mixer with Elevator.

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Let us quote on your

Hoists, Crushers, Derr
Boilers, Pumps, Roc
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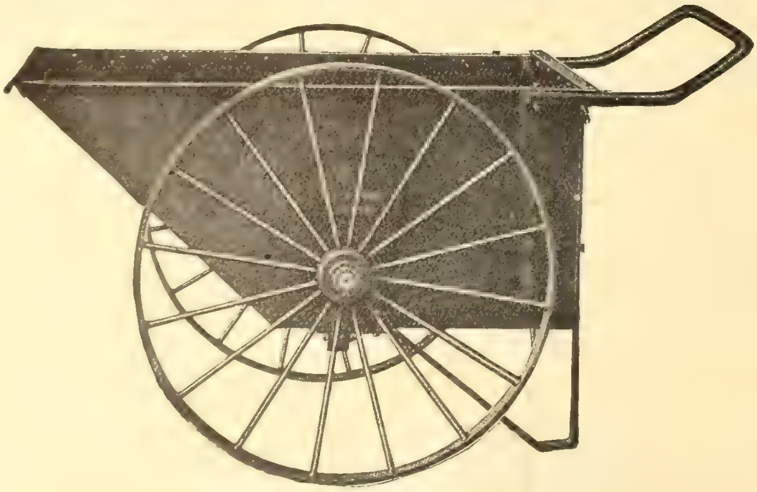
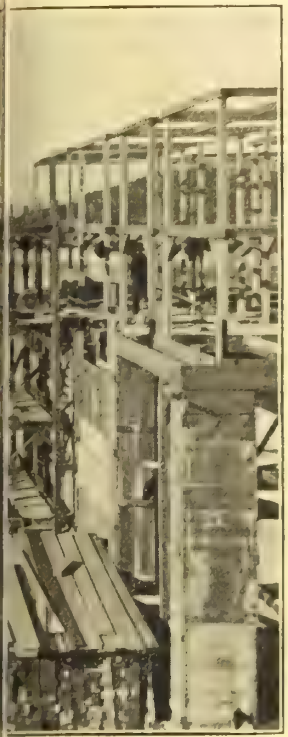


Sterling Concrete Carts and Barrows.

Head Offices and Warehouses :
Montreal

MUSSEN



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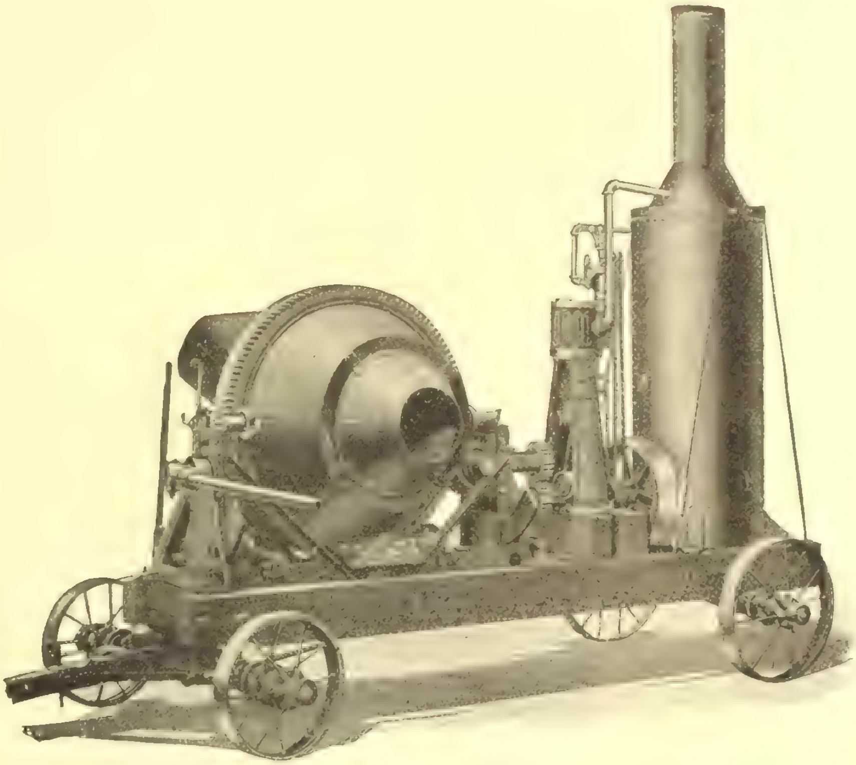

Smith Mixer on Truck with Engine and Boiler.

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Strong - Durable

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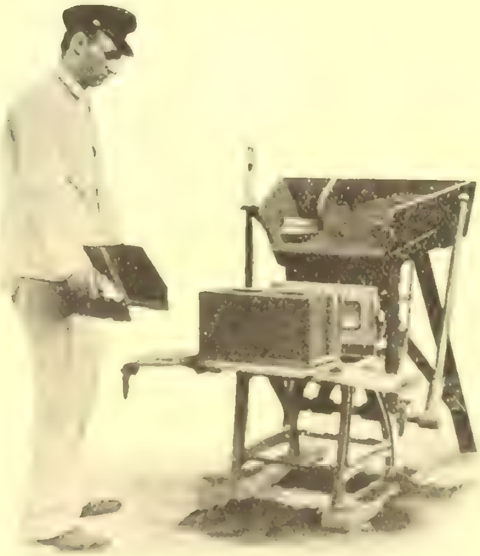

Ideal Concrete Block Machines.

LIMITED

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Toronto - 73 Victoria St.
Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg.

All Floors in this Building are Reinforced Throughout with

Beath's Triangle Mesh

Some Users:

Winch Building,
Vancouver, B.C.

Victoria Sheds,
Victoria, B.C.

Petrolea Bridge Co.,
Petrolea, Ont.

Filtration Plant,
Toronto, Ont.

Thomas C. Watkins
Hamilton, Ont.

Halifax P.O.,
Halifax, N.S.

Dominion Exp. Co.,
Ottawa, Ont.

Erindale Power Co.,
West Toronto.

Dominion Concrete
Co., Kemptville, Ont.

Some Users:

Joseph Vincent,
Union, Ont.

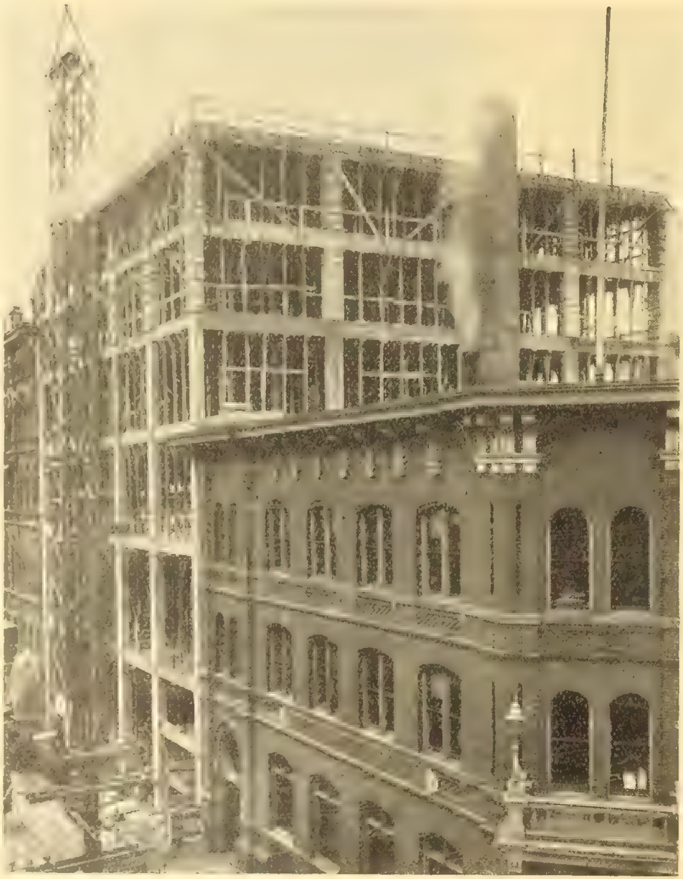
Robert Simpson Co.,
Ltd., Toronto.

Murray Shoe Co.,
London, Ont.

Septic Tanks,
St. Thomas, Ont.,

Septic Tanks,
Clinton, Ont.

Transformer Stations at Toronto, Dundas, Niagara Falls, St. Thomas, London, Woodstock, Paris, Preston, St. Marys, Stratford, Guelph and Berlin.



Cut shows Reinforced Concrete Building under construction for the Thomas C. Watkins Departmental Store, Hamilton.

This System of Concrete Reinforcement is rapidly becoming known as "The Most Satisfactory and Economical System" on the market. One million square feet of Triangle Mesh sold in Canada during 1909, its first year, attest its popularity among discriminating Architects, Engineers and Contractors. If you are contemplating or have under construction a modern fireproof building it will pay you to investigate "The Beath System."

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W. D. Beath & Son, Limited

Toronto - Canada

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY

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The Cement Convention at London, Ont.

There can be no doubt that the existence of the Canadian Cement and Concrete Association is amply justified. At the second annual convention at London, Ont., last week, it was shown plainly that the Association is supported by the strongest and best of the cement interests, not only in Canada but in the United States, and the ultimate success of the body is assured. The comparatively meagre attendance at the convention, after all, is only what must have been anticipated. While the Association was temporarily the loser of many of its supporters through its decision to hold this meeting at London, it is probable that many advantages will accrue subsequently from the course adopted.

The strongest enemy of the cement industry could only criticize this convention in one particular, i.e., the attendance, and this is more than half explained by the fact that the convention was only the second in the history of the Association; and, even at that, all the arrangements for the event were completed within a couple of months. Several papers of a very high order are reprinted elsewhere in this issue. Others of special interest to our readers will appear in a later number. One of the most important works that was completed was the formulation of standard specifications for the use of reinforced concrete. These specifications appear to cover all points of the work in a most complete and satisfactory manner and will doubtless be of great assistance to the industry.

The exhibition at the [illegible] attracted a good following and most of those who either attended the Show as visitors or put in their time as exhibitors, were fully satisfied. Most of the exhibitors reported numerous sales and inquiries. Some of the most interesting of the exhibits are discussed elsewhere in this issue. Every cement worker should keep in touch with progress made in these lines, for if he is in any way to anticipate the demands of his customers he must be well posted on the latest improvements in appliances for construction purposes. The live man will always be found at places where there is an opportunity to extend his business into new fields and improve his knowledge. And it pays to be with the live man, for one is judged by the company he keeps.

The Canadian Cement and Concrete Association is exerting every effort to create one of the foremost professional and industrial organizations on the continent. The information accumulated at the convention last week is valuable not only as an addition to the scientific literature available on this continent, but as giving greater prestige to the Canadian cement industry.

Selection of Materials

While the production of a sane and scholarly design is perhaps of paramount importance in the construction of an work great or small, the selection of the best possible materials for its execution is certainly not less than second in the list of essentials. Instances of failures due to the use of unwisely chosen mateials are not rare, while more than a few buildings of most ordinary design have assumed considerable interest in the finished structure due to a happy choice of materials. It is a subject the young architect would do well to study carefully. If, with a thorough knowledge of design is combined an ability to select the materials best suited to the execution of each conception and also a general fund of information concerning the strength, character and general adaptability and availability of building materials, the greatest heights will be reached. No one of these qualifications is lacking in a successful architect.

Open or Closed Shop?

It is obvious that the question of closed shop or open will again become a prominent and in many instances an acute one to the building trades interests. The decision must ultimately rest with the proprietors, but it will be well for all contractors who are in any measure likely to encounter the question, to be well prepared for it in the way of having given it full and due consideration. Sometimes the demands are made with relatively little time for consideration, and it is well to have all the facts in hand against such a contingency, and not have to beg for time in which to consider such a request. Organizing has been going on steadily and though several demands have been made along this line to [illegible] contractors. It is for them to handle the question, and if they can see it to their advantage to accept the closed shop, that will settle it for that individual concern.

Perspective View of Building as it will Appear on Completion

Showing Exquisite Interior of Main Banking Room

Architects: McKim, Mead and White, New York City.

Winnipeg's Proposed New Bank Building

Features of the Design for the Classical Structure to be Erected in the Western Metropolis by the Bank of Montreal

The proposed new building for the Winnipeg branch of the Bank of Montreal is derived from purely classical models, handed down to us from the days of ancient Greece and Rome. The building is rectangular in plan. The exterior is to be built of a very white granite, closely resembling marble, from the quarries at Bethel, Vt., and its design consists of a Corinthian portico of six columns on the front, and a treatment of Corinthian pilasters, with windows between them, at the sides, the whole surmounted by an attic. Above and behind the attic rises a rectangular roof house, in which the quarters of the staff are located, and which forms a crown or roof to the structure when seen from a distance, taking the place of the domical form so frequently adopted on buildings which are square in plan.

The property on which the building is to be placed is triangular in shape in front, and a study of the ground floor plan will show that the portico and steps have been designed for the maximum amount of projection permissible within the property lines. By this treatment, the building is given the greatest possible prominence as to location, and the throwing of the triangular portion of the front part of the property into sidewalk and street practically creates a public space, or square, at this point of the city, so that the bank building becomes not merely an incident in a long street, but one of the distinguishing features, or landmarks which help to divide a city into familiar districts.

The interior of the building is in the form of a basilica, based on the colonnaded halls of ancient Greek times, which were used as meeting places, for business and social purposes. The design consists of superimposed Ionic colonnades, the central, or main portion of the room going through two storeys, with a gallery, for the use of the Royal Trust Company, on all four sides. The entire banking room is to be treated in practically a monotone, with columns and side walls of light buff Botticino marble imported from northern Italy, with a simple ceiling painted with light colors in the Greek manner. The use of one material will give the largest possible expression to the room, and the neutral buff tone of the marble chosen is well adapted to obtain a warm, cheerful sunny effect

In the basement are located extensive vaults, safe deposit, coupon and storage rooms, clerks' lavatories, boiler room, etc. Above the main banking room are two floors of quarters for the staff and janitor, with sitting rooms, bed and bath rooms, and kitchen, lunch and dining rooms conveniently arranged for serving all those connected with the bank.

The general contract for the erection of the building has been awarded to the Norcross Brothers Company of Worcester, Mass. A list of the sub-contractors is not yet available as a considerable portion of the work has not been contracted for.

Personal News and Notes

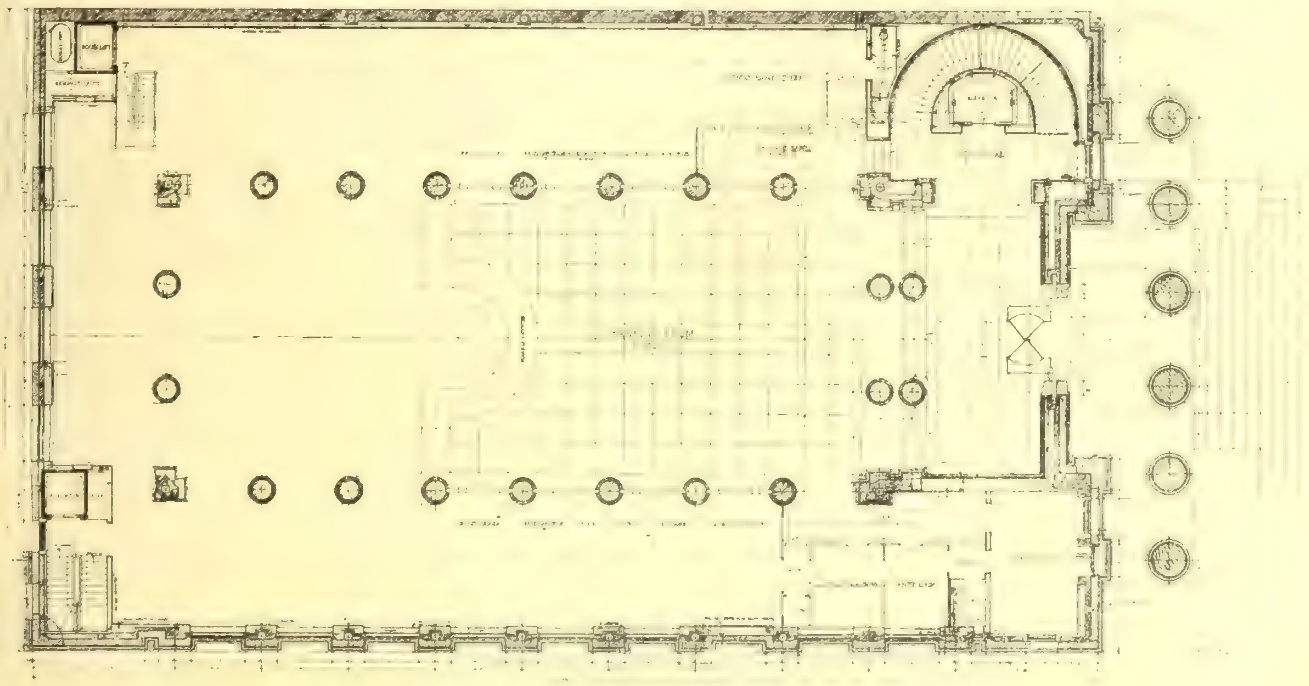
We regret to report the death of Mr. Robt. Fortune, a well known builder and contractor of Parkdale, Toronto.

Mr. T. S. Scott, assistant city engineer of Toronto, has resigned. He is thinking of going into the contracting business at Vancouver, B.C.

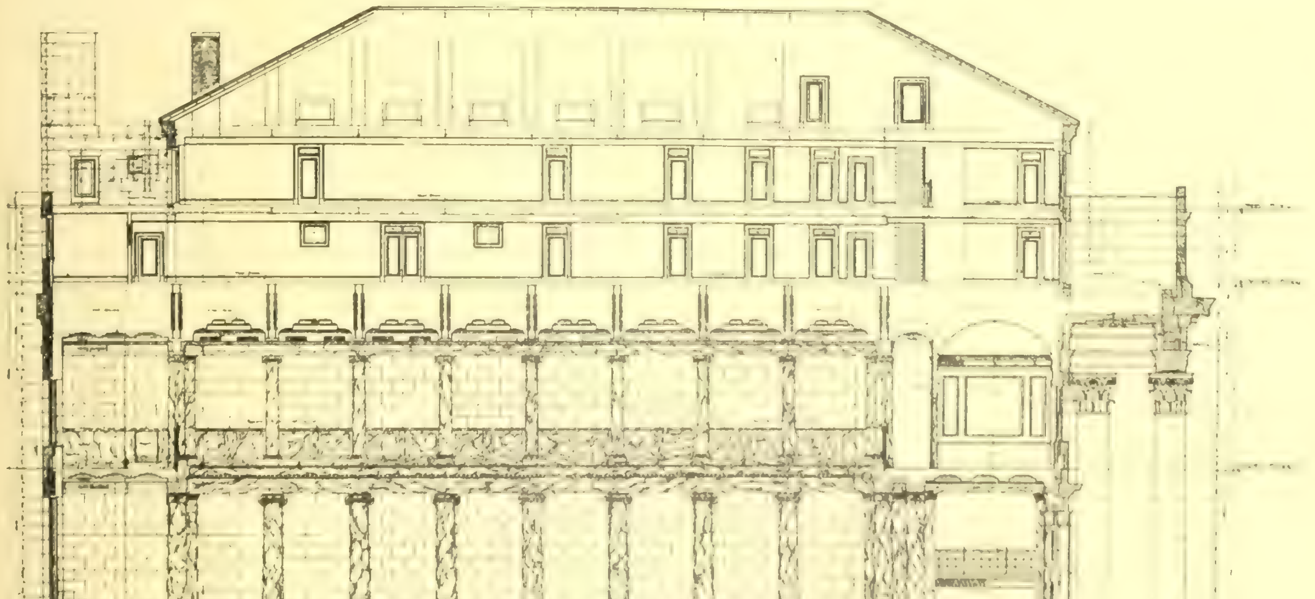
City Engineer Macallum, of Hamilton, Ont., was one of a deputation that visited New York recently with a view to obtaining information on asphalt roads.

W. K. Greenwood has been appointed town engineer of Orillia, Ont., at a salary of $1,800 per annum. He is a graduate of the S. P. S. and was associated with Mr. Willis Chipman in the construction of various waterworks systems.

Proposed Bank of Montreal, Winnipeg, Man.



Ground Floor Plan



Section on Axis Main Hall

The Cement Convention and Exhibition

Report of the 2nd Annual Meeting of the Canadian Cement and Concrete Association Held Last Week at London, Ont.—Features of the Show

The Canadian Cement and Concrete Association have many reasons for self-congratulation over the success which attended their second annual convention and exhibition held at London, Ont., March 29—April 1st. The attendance was not all that could have been desired, but in the case of this particular convention this was not the sole consideration. Prior to the meeting some adverse criticism was heard relative to the wisdom of holding the convention in London, but the situation in which the Association now finds itself and the favorable conditions, financially and otherwise, under which it commences the work of another season, vindicates the judgment of the executive. The attendance, though comparatively small, was representative of the best interests of the industry in Canada and the United States Among those who signed the register, and others in attendance, were the following:

Peter Gillespie	Toronto.
R. E. W. Hagarty	Toronto.
Percy H. Wilson	Philadelphia, Pa.
A. W. Connor	Toronto.
C. R. Young	Toronto.
Chas. Talbot	London, Ont.
James Pearson	Toronto.
R. L. Humphrey	Philadelphia, Pa.
Alfred Rogers	Toronto.
W. H. Day	Guelph, Ont.
Gustave Kahn	Toronto.
W. H. Essery	Toronto.
R. J. Lucas	Watford, Ont.
Jno S. Gray	Woodstock, Ont.
I. S. Macdonald	Toronto.
J. H. Parke	Toronto.
Chas. Wonever	Montreal, Que.
Wm. Crellin	Kintore, Ont.
F. J. Ure	Woodstock, Ont.
Jno. A. Watson	Laskay, Ont.
H. U. Bedell	Picton, Ont.
Robt. Oliver	Listowel, Ont.
A. Grosch	Listowel, Ont.
J. G. Wilson	Burlington, Ont.
A. G. Larsson	Owen Sound, Ont.
R. E. Holliday	Toronto.
W. F. Scott	Toronto.
Wm. Tytler	London, Ont.
A. J. Cromar	Brantford, Ont.
A. A. Gillies	Glencoe, Ont.
O. W. Jersey	Forest, Ont.
Harry Boyd	Osgoode, Ont.
A. E. Nutter	London, Ont.
G. G. Kinsey	Port Elgin, Ont.
A. F. Wells	Toronto.
R. K. Beecraft	Nixon, Ont.
C Crowley	Stratford, Ont.
J. H. Chubb	Chicago, Ill.
J. A. Douglass	Alliance, Ohio.
Jno. Stewart	Blyth, Ont.
Dr. S. Woolverton	London, Ont.
R. E. Waltham	Kerrwood, Ont.
H. A. MacLean	Sarnia, Ont.
W. M. Gray	London, Ont.
Jno. Dunbar	St. Marys, Ont.
Harold R. Watson	Laskay, Ont.
R. A. Plumb	Detroit, Mich.
G. W. N. Day	"Contract Record."
F. W. Scherbarth	"Contract Record."

The first event of the meeting took place on the evening of March 28th, when the exhibition at the Princess Rink was formally opened by his Worship, Mayor Beattie. The evening was especially reserved for the reception of the citizens of London by the officers and members of the Association.

The convention proper was opened at 2.30 p.m., Tuesday, March 29th, by the president of the Association. Professor Gillespie, the text of whose address will be found in another column. The secretary, Mr. R. E. W. Hagarty, then read a paper entitled, "The Use of Concrete in Dwelling House Architecture," prepared by Mr. Ernest Wilby, architect, Detroit, Mich. This was followed by an interesting paper from Mr. R. A. Plumb, of Detroit, Mich.

An extract from Mr. Baker's address, on the "Use of Cement in Architecture," read at the evening meeting, will be found elsewhere. After the reading of this paper, some discussion ensued as to the necessity for having packages of cement labelled with the date of their manufacture. Mr. Larsson, of Owen Sound, contended that the storage of cement does not harm the article, provided the storage is effected in a satisfactory and careful manner. One speaker held that while cement in bulk improves, cement in packages deteriorates, and expressed the opinion that 30 days should be the limit for storing the latter. The only protection, from Mr. Kahn's point of view, are public testing plants. Mr. Kahn thought that no cement should be used until first tested. Mr. Wilson claimed that the tests carried out by every cement mill are more reliable than those undertaken by outside laboratories, for the reputation of the mill depends solely upon the test. Mr. C. R. Young said that cement should be tested at the time used on the work. Architects and engineers should insist on this being done. Mr. Kahn concurred with Mr. Young. Mr. Wilson said that the question resolved itself into that of buying cement of approved brand.

The morning of Wednesday, March 30th, was devoted to the framing of standard specifications for reinforced concrete. This work was undertaken by a special committee composed of Messrs. Peter Gillespie, Gustave Kahn, C. R. Young and R. E. W. Haggarty. The proposed regulations, as drawn up by this committee and finally adopted by the Association, will be printed in our issue of April 13th. These specifications will be issued under the authority of the Association and will be such as may be adopted by towns and cities throughout the country. They will doubtless do much to ensure safe and economic construction in concrete. The Association has practically adopted the specifiations of the Canadian Soiety of Civil Engineers for Portland cement.

On Wednesday afternoon, Mr. A. W. Connor, of Messrs. Bowman & Connor, consulting engineers, Toronto, gave an interesting paper, entitled, "Concrete Bridges." This was followed by a paper, entitled "An Analysis of Concrete Bridge Failures," by Mr. C. R Young, of Barber & Young, bridge and structural engineers, Toronto. Mr. C. W. Boynton and Jas. Bell were unavoidably prevented from attending to read the papers that had been assigned to them.

On Wednesday evening, the delegates listened to an interesting address, entitled "The Engineer and the Finished Work," prepared by Mr. A. W. Campbell, Deputy Minister of Railways and Canals, Ottawa. Papers were afterwards read by Messrs. Chas. Talbot, county engineer for Middlesex, and Jas. Pearson, president of the Constructing & Paving Company, Toronto .

An Informal "Social" at the London Club

After the evening session on Wednesday, a select party of the delegates, numbering about 25, repaired to the London Club at the invitation of Mr. Gustave Kahn, and by the courtesy of the members of the club. Of the latter in attendance may be mentioned ex-Alderman Ferguson, who seems to make the care of convention delegates a special hobby. An impromptu concert was held, the whole being under the direction of Mr. Kahn. Several excellent speeches were made. Professor Gillespie made some appropriate remarks concerning the work of the Association. Ex-Ald. Ferguson, in a humorous address, extended to the members the privileges of membership in the London Club. Mr. Alfred Rogers, who was called upon for a few remarks, assured those present that he had never before made a speech in his life. His maiden effort was well received, as was also an excellent recitation by Mr. Jas. Pearson, Toronto. Mr. L. V. Thayer, president of the Peerless Brick Machine Company, Minneapolis, and others from across the border, spoke for the United States.

Election of Officers

At the election of officers, which took place on Thursday, March 31st, Professor Gillespie was re-elected president and R. E. W. Hagarty, Toronto, secretary. Mr. W Fry Scott, Toronto, was chosen vice-president. The other members of the new executive are: Gustave Kahn, Toronto; T. L. Dates, Owen Sound; W. H. Ford, Canada Cement Company; C. R. Young, Toronto; D. C. Raymond, Toronto; Jas. Pearson, Toronto; W. Scott, Roman Stone Company, Toronto; C. F. Pulfer, London; Kennedy Stinson, Montreal; A. E. Uren, Toronto, and I. S. MacDonald, Toronto.

The committee brought in the following recommendations which were adopted:

"That the convention consider the advisability of limiting the number of councillors to twelve, eleven being nominated in accompanying report, the twelfth to be an architect of first-class standing, to be appointed by the executive.

"In the opinion of this committee the permanent secretary, Mr. Hagarty, should be appointed to the position of treasurer of the association, and the office of chairman of finance be eliminated.

"This committee further recommends that the appointment or election of an honorary president be considered by the convention, and that the executive be instructed to appoint an honorary president to act for the coming year."

Thursday afternoon was devoted to the reading of the following papers: "Concrete in Europe," Mr. R. L. Humphrey, president National Association of Cement Users, Pittsburg, Pa.; "Some Experiments with Cement Tile," Prof. W. H. Day, Ontario Agricultural College, Guelph; "Uses of Concrete on the Farm," Mr. P. L. Wormeley, testing engineer, Washington, D.C.; "The Hardening of Portland Cement," Mr. A. G. Larsson, chemist, Grey & Bruce Portland Cement Company, Owen Sound, Ont.

The annual dinner of the Association, which gave place to an informal luncheon, was held at the [illegible] Hotel on Thursday evening, and proved a most enjoyable affair.

At the closing session of Friday, April 1st, the papers contributed included: "The Commercial Aspect of Reinforced Concrete in Canada," by Mr. Gustave Kahn general sales manager, Trussed Concrete Steel Company of Canada, and "Concrete from the Contractors' Standpoint," by Mr. D. C. Raymond, vice-president, Bishop Construction Company, Montreal and Toronto. These and other interesting matter will be printed in later issues of the "Contract Record."

PRESIDENT'S ADDRESS

The Canadian Cement and Concrete Association has completed the second year of its history with an outlook for usefulness which is undoubtedly brighter than it was a year ago. Its membership is larger; its name and aims are more widely known; its financial status is more comfortable, and, in a few particulars, it has learned wisdom through the mistakes of the past. As anticipated in my opening remarks to you last March, a permanent secretary has been appointed to whom has been delegated the clerical work connected with the Association. The new regime is proving very satisfactory and I think that this will be a means to extending its influence and work. A committee on standard specifications has been at work, and will report to you during the week on the results of its labors. It is felt that by issuing standard specifications which are up to date, but also sufficiently conservative to meet the approval of moderate people, the Association will be doing something to endorse safe and economical construction in concrete.

Regarding the attitude of the Canadian Cement and Concrete Association toward other building materials, I have only a word to say. While it stands for the dissemination of authentic information regarding the uses of a comparatively new material; for the encouragement of whatever in cement construction is safe, economical and artistic, and for the elimination of whatever is unsafe, wasteful and unsightly, it does not decry nor condemn any other legitimate building material. It recognizes that others have claims and advantages of their own and does not advocate cement construction where another material is manifestly superior for the special situation under consideration. It recognizes also that steel and concrete and clay products, and wood make, on occasions, most excellent structural combinations, and feels no enmity nor jealousy towards any of them.

Stages of Pioneer Progress

It has been pointed out that human progress from pioneer conditions always divides itself into three noteworthy stages. These are, first, the period of individual enterprise involving the conquest of the wilderness and making for the benefit of the man; second, the period of collective enterprise making for the benefit of communities, or of the individuals constituting them; third, the period of co-operative enterprise, largely altruistic, for the advantage of the nation, and for succeeding generations as well as those of the present. This last is the era upon which we are now entering, an era when an endeavor to use wisely, to avoid unnecessary waste and to look to the requirements of the future is being made. As a sign of the times, we have commissions on the conservation of natural resources. It is to a recognition by the present generation of its responsibility to posterity, that these important commissions of inquiry in the United States and Canada owe their beginning. "The duty of man to man, on which the integrity of nations must rest, is no higher than the duty of each generation to the next; and the obligation of the nation to each actual citizen is no more sacred than the obligation of the citizen to [illegible] the nation's duties and responsibilities."

It is only of recent years that the attention of people in the New World has been drawn to the fact that the natural resources of this continent are not inexhaustible, and that if the duty of the present to succeeding generations is to be faithfully discharged, some method of conserving these resources must be devised. The most [illegible] of all waste is destruction, and the most destructive of all agencies is fire, and to the extent of its ravages in this country at the present time, to a comparison of our own country's fire loss with that of other lands, and to means for minimizing this appalling waste I invite your attention for a few minutes to-day.

Fire Losses in the United States

A report of the United States Geological Survey, recently to hand, affirms that during the year 1907 the per capita loss in the United States due to the destruction of buildings and their contents by fire was $2.51, while the average corresponding per capita loss in Austria, Denmark, France, Germany, Italy and Switzerland during various periods from 1898 to 1904 was only .33, an amount only one-eighth that quoted for the United States of America. It must also be remembered that to the actual per capita loss as given above, viz., $2.51, must be added a number of items indirectly if not directly chargeable to the fire fiend. Premiums are paid to fire insurance companies obviously very much in excess of the compensation for fire losses returned to the insured; fire fighting equipment and a water distributing system must be installed and maintained at an expense very much in excess of what would be required for purely industrial and domestic necessities. These, the statistician has estimated annually as follows:

Excess of premiums paid over amount of losses returned, per capita	$1.71
Maintenance of waterworks, chargeable to fire service exclusively, per capita	.33
Maintenance of public fire departments, per capital....	.57
Maintenance of private fire protection, per capita....	.21

This makes a total annual per capita tax of $5.33, and represents an aggregate cost to the people of the United States of $456,000,000, an amount the magnitude of which it is exceedingly difficult to comprehend. If through any cause, it were possible to reduce the actual fire loss in the United States to a figure comparable with what prevails in the countries of continental Europe, there would be a proportionate reduction in the related and accessory items as well, which, it is estimated, would reduce the aggregate loss through fire to $90,000,000, which would mean a saving to the Republic of $366,000,000. In consequence, it would appear that the United States is paying annually a preventable tax sufficient to construct a Panama Canal. For the year 1907, the total value of buildings erected in the Republic was conservatively estimated at $1,000,000,000, and from what has been said above, it is seen that a loss by fire equal to practically half the value of the buildings constructed, was suffered by the American people. This is a loss that no system of account keeping or no method of clever logic can conceal. Destruction by fire is absolute and irreparable, and insurance when paid to the owner, serves only to distribute the loss among the whole body of the insured. This state of affairs is truly appalling and it is a striking wonder that economists have given so little attention to the evil and its remedy.

Fire Losses in Canada

The "Monetary Times" of Jan. 8, 1910, reports the aggregate loss in Canada due to fire, during the year 1909, as $18,905,000, with a total loss of life of 219. The daily press report of a fire was first accepted by this journal and then enquiries were addressed personally to the owner and occupant of the property destroyed. In this way fairly authentic information regarding the magnitude of the loss was obtained. An actual fire loss of one and three-quarters millions of dollars per month in Canada must make us pause. This is equivalent to a per capital loss of $2.70, seven per cent. greater than that reported by the United States, 23 times as large as that reported for Italy, 6 times as large as that reported for Germany, and 9 times as large as that reported for France.

Assuming that for Canada, the accessory and related losses due to insurance, fire protection, etc., are of the same order as in the neighboring Republic, Canada's sacrifice to the fire monster, directly and indirectly, will approximate the enormous total of $40,000,000 per year. This amount is four times the yearly interest on Canada's national debt, is nearly equal to the total annual revenue from duties on imports into Canada, is seven times as large as the entire annual expenditure for postal facilities in this country, is twice as great as the entire expenditure by the people of the country for the maintenance of churches and clergy of all denominations, and is sufficient to construct four Dreadnoughts annually. In addition to this, there were sacrificed last year, four lives per week for every week of the year, a number almost large enough to place a victim's skull on every milepost between Buffalo and Detroit.

On this side of the water we view with alarm, the manner in which the European powers are breaking the backs of their taxpayers in order to render their armaments on land and sea more and more formidable, and we are sometimes in consequence led to doubt the real progress of civilization, not thinking perhaps that our own prodigality in the matter of destruction by fire must arouse in them a feeling of wonderment at the folly of the so-called progressive American people.

The cause of such destruction is not far to seek. Our buildings, many of them, are constructed of most inflammable materials, and although they may be protected by the most perfect fire-fighting appliances that ingenuity can devise, conflagrations are inevitable. The disastrous Toronto and Baltimore fires of 1904, the San Francisco calamity of 1906, the Collinwood schoolhouse tragedy, and the conflagration in Chelsea, Mass., in 1908, are still fresh in people's minds, and it is safe to say that had fireproof construction as to-day understood, prevailed generally, these unfortunate disasters would either never have occurred or the evils attending them would have been very much less than they actually were. The alarming feature of the entire situation is that similar calamities may occur any day in any city in Canada or the United States.

In America, combustible building materials are employed to an extent that would not be tolerated in Europe. Older in the world's history than America, these nations have developed a wisdom in construction in comparison with which America suffers greatly. In many European cities, the erection of wooden buildings is prohibited and the use of inflammable materials in construction is so rigidly regulated and overseen that fires are practically confined in every instance to the building in which they originated. It is manifest from the results that the consequences of European paternal government are not all disadvantages.

Timber Supply Giving Out

A report from a branch of the Government service at Washington, D.C., has this to say: "The timber supply of the United States is rapidly approaching exhaustion, and unless means are taken to limit the waste (a great deal of it through fire) and to replenish the supply through reforestation, the timber resources of the country will be exhausted within the next quarter of a century. The known supplies of high-grade iron ore in this country, estimated at more than 4,788,000,000 tons, cannot be expected to last beyond the middle of this century unless the present increasing rate of consumption is curtailed. There are in addition about 75,000,000,000 tons of low-grade iron ore which will undoubtedly be used to some extent as the price of iron advances. The supplies of stone, sand, gravel, clay, cement, lime and slate are practically inexhaustible, and as the supplies of timber and iron are depleted and the prices of these are increased, it is evident that the United States must turn to concrete-making materials, clay products, and building stone as substitutes for wood and iron." Continuing, the same reports asserts that "the mineral materials available for structural purposes may be divided into two classes: (1) iron, steel, copper, nickel, and their manufactures, the supplies of which are limited and which are themselves subject to destruction through weathering, fire and other causes; (2) stone, clay products, and cement and concrete manufactures, which are less subject to destructive agencies and the supplies of which are practically inexhaustible."

Substitutory Materials the Solution to the Problem

In building and construction work the substitution of the materials of the second group for the more commonly used wood and metal manufactures should be encouraged as having an important influence on the preservation of the supplies of the more perishable and scarcer materials. The use of building stone and clay and cement products in this country has been restricted by competition with the much cheaper wood products and the more easily fabricated and more available metal products. Improved methods of preparing the raw materials for use in building construction are, however, rapidly diminishing the difference in cost, and careful investigation as to their structural qualities and the more suitable structural forms would have an important influence in further reducing this difference in cost and in enlarging the use of the more permanent materials." It is manifest from the above that these materials, which occur in almost inexhaustible quantities, and which, when fabricated into structural forms, are least susceptible to destructive agencies, must be looked to to save the situation. They constitute the really fireproof building materials, as has been attested by numerous severe trials. Building regulations on this continent, however, have been very much to blame in their failure to compel, or at least encourage, their use. They have permitted the erection of structures either of inflammable materials; or of incombustible materials in such a way that when a fire occurs in the contents of a building it is not usually confined to that building. Our fire protection appliances are probably as modern on this continent as elsewhere, so that it seems conclusive that to insist on the use of fireproof building materials in the first place, and in the second, to scrutinize carefully the method of using them so that fires, when they do occur, will be properly confined, will be the remedy. It is exceedingly poor economy to sacrifice to-morrow the accumulated wealth of years of labor for the immediate convenience and needs of to-day.

Training and Work of Skilled Inspectors

The Connecting Link between Designing Engineer and Contractor Inspection by S. P. S. Graduates "The Engineer and the Finished Work"*

By A. W. Campbell, Deputy Minister of Public Works

Technical education is a subject receiving much attention in all progressive countries to-day. Germany has set the pace. She has shown what science and skilled workmen can accomplish. Her representatives are met throughout the world, gathering scientific information regarding raw materials, regarding systems of manufacture, regarding details of workmanship, in order that these may be available in producing an improved quality of goods at a decreased cost. This is one of the great secrets of Germany's extending commerce—technical education. England has grasped this fact, and with the foresight and business instinct, characteristic of the British people, we may confidently affirm that its usefulness will be tested to the full extent. Canada, in spite of the many demands upon our resources, is making progress in this regard, and governments and educational bodies are making substantial progress in the matter of manual training and the higher technical education.

This is a subject in which the engineer is keenly interested from a direct and personal standpoint. The result of his own education, of the labour, skill and care that he puts into his plans and specifications, are dependent upon the grade of workmanship available in securing ultimate results. His own skill and foresight are not sufficient, good material is not sufficient, if these are to be utilized wholly in a rough and haphazard way by untrained workmen and inferior inspectors. The situation is one which every engineer in Canada must have at times keenly appreciated, when he has looked upon the defective work presumably carried out in conformity with his plans and specifications.

The designing engineer cannot be always on the ground to give the necessary direction which even skilled workmen require, and between the engineer and the artisan lies the office of the inspector. The training of the engineer is necessarily made up of what we may roughly term "the practical" and "the theoretical" Both are essential. With the engineer, on the one hand, the theoretical should predominate. With the inspecter, the practical is necessarily the most essential feature. The inspector has need of both the theoretical and the practical if he is to properly interpret the engineer's intention and at the same time apply them in such a way that the contractor can accept in full his directions.

There is a great need in Canada to-day for skilled inspectors who will act as the connecting link between the designing engineer and the contractor. The inspector is not simply a watchdog on the work. He is there to fill a place which the contractor is not, cannot be, expected to fill. I would not separate wholly the work of the inspector from the profession of the engineer. I know of no better training for a young engineer than that experience, when, call him what you will—inspector, resident engineer, assistant engineer—he has the opportunity of remaining on the ground and studying all the details of practical workmanship. There is need, however, that young engineers prepare themselves for the inspector's duties in a proper manner, by a period of, let us say, apprenticeship.

Connecting Link Between Engineer and Contractor

Theory alone will not make a good inspector. As I have pointed out, the predominating qualification of an inspector should be the practical. He should know the different grades and qualities of material. He should know the different grades and qualities of workmanship. He should know how much work a man or men do in a day, and he should know as far as possible all those details of machinery and methods of this work which lead to good and bad results.

This information is necessary to him as inspector, but doubly essential if some time he has [illegible] or when, more closely following the duties of a professional civil engineer, his work will consist of the preparation of plans and specifications, in which he will be compelled and

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*Delivered at the Second Annual Convention of the Canadian Cement and Concrete Association.

[illegible] by the limitations imposed upon him by the grade of workmanship, material and cost that are the tools with which he must ultimately get results. In Canada to-day we have splendid institutions of scientific education connected with our universities. We establish technical and manual training for artisans, but I would commend to you a more difficult school perhaps, but one in which the rewards are exceedingly satisfactory and gratifying, and which are absolutely essential to the highest grade of engineer. In this school he could start at the lowest rung and work his way up, as he has done in the School of Practical Science. The school to which I refer is the School of Experience, in which, as with all other human endeavors, the way is hard and difficult in proportion to the goal to be attained.

The inspector requires technical training, combined with experience, to interpret not so much the letter, as the spirit of the plans and specifications. The inexperienced technical student is, on the one hand, apt to be too particular over unimportant details; but the layman is careless and pliable in the hands of a determined contractor. A couple of seasons in a minor capacity, with two or three years technical study is a training such as will enable an ambitious young man to become a thoroughly efficient inspector.

Inspection by S. P. S. Graduates

The Department of Public Works has frequent occasion to employ inspectors on works under contract. During the past season Mr. Arthur Sedgwick, a graduate of the School of Practical Science, was resident engineer or inspector in charge of regulating dams at the outlet of Dog lake, the head waters of the Kaministiquia river. These dams were in three sections, of concrete with considerable rip-rap, and when completed it will be possible to develop 40,000 h.p. within a mile of the lake.

A work at Dryden on the Wabigoon river, comprising a steel bridge of 80 feet span, concrete abutments 13½ feet high, and a filling 160 feet in length, rip-rapped, was supervised for the Department of Public Works by Mr. W. H. Manning, of the School of Practical Science. Mr. J. W. Hackner, a graduate, supervised steel and concrete bridges at Nairn, Severn and Vermillion river. The Vermillion bridge is in two steel spans of 150 feet each, with concrete substructure and a 300-foot timber trestle. The Nairn bridge is of steel, 200 feet long, on concrete abutments; and the Severn work was a concrete arch of 58½ feet span, built by Messrs. Gagne and Jennings. Mr. Geo. Hogarth, of the School of Practical Science, was inspector for the tunnel bridge on the Mississaga river, north of Thessalon, a steel arch of 93 feet span, with a 60-foot steel trestle approach on concrete foundations. Mr. F. W. Robertson, of the School of Science, has made laboratory tests of cement for a number of works.

Technical men are not always available, so that we are compelled frequently to employ men of more or less practical experience, but without the theoretical training. Too often we find that these are men who do not value the work of the engineer or architect. To the layman, the architect or engineer is apt to be a man of fanciful ideas, who can write long specifications, and draw more or less intricate pictures, but who has no idea of how the work is to be carried out. The untrained man, lacking the basic information as to why the specifications require certain results, is wholly unable to determine how it should be done, if he has not actually seen it performed in his past experience. In concrete, for instance, he has no conception of why the stone and sand should be clean, why they should be mixed in certain set proportions, why the mixing should be thorough. He blunders and stumbles along, hoping the results will be satisfactory, but he can give no positive assurance that they will be.

It is the unexpected that happens. No plans or specifications can be so prepared as to meet all emergencies. When something not contemplated by the plans and specifications occurs, the laymen's training is seldom equal to the occasion. His opinion of engineers and architects very frequently causes him to find a solution of his own. Lacking the knowledge as to why a thing should be done, he is incapable of determining how the emergency should be faced. When the engineer goes on the ground, it is too often to look with horror on the blundering work that has been carried out.

In making these statements, I am reminded that it is difficult to generalize. There are some competent laymen inspectors. But they are men who have grown up on practical work, who are shrewd observers, and have a native capacity that carries them beyond the ability of the average man. Inspectors of this class are rare, however, as they are usually employed as contractors' foremen, or graduate to the ranks of the contractor.

Towns and cities, all municipalities, are frequent offenders in the matter of inspection. Much municipal work has no inspection whatever. Inspectors, when employed, are apt to be local men with a little influence, who have been failures in their own line of work or business. They have great respect for the opinion of the contractor who is doing the work, and very little for the engineer who merely designed it. The inferior results and failures throughout the province in municipal improvements are the unfortunate verification of this situation. When failure occurs, the public look to the engineer as the responsible official, and the reputation of the engineering profession has suffered much in consequence.

Men without technical training but with experience as contractors in carrying out works under an engineer's plans and specifications, are often looked upon as being highly capable of supervising work under other contractors. These men as contractors may have been eminently successful, the result probably being that they were obliged to follow carefully prepared plans and specifications, and were assisted in the execution of the work by skilled and competent inspectors. They, not being technically trained men, must not be assumed to be capable inspectors because of the absence of that necessary technical knowledge without which the inspector cannot possibly interpret the intention of the designer or understand the reasons for the details of the design or the carrying of these into practical execution. Inspectors, as with engineers, mechanics and other skilled workmen, are competent and capable as the result of their genius, knowledge and training, and anything short of this is liable to result in the condemnation of the design, to reflect upon the materials used in the construction, and entail loss to the investors.

These are some of the difficulties which we have to face in carrying on public work. The situation is possibly one which can never be wholly overcome, but we are looking to the technical schools and colleges to supply us with men who will have the necessary practical and theoretical training, and we are at the same time educating public opinion as to the necessity of spending more upon the expert supervision of these works. The public are slow to grasp the value of expert services, and it is only with costly experience through mistakes and blunders of untrained inspectors, that these matters will ultimately adjust themselves.

At a recent meeting of the Winnipeg Board of Control, the claims of the Lutz Surface Heater for asphalting purposes were brought before the members by the Equitable Asphalt Maintenance Company, of Kansas City, Mo. It is claimed by the makers of this machine that it has the advantage of heating the surface on which the asphalt is to be laid to the same heat as the asphalt itself, thus ensuring perfect vulcanization. The new invention is said to do its work much more rapidly than has been possible hitherto, much more durably, and at half the cost.

An Architect's Views on the Use of Cement

Increasing Popularity of the Canadian Product—Suggested Improvements in its manufacture—Cement Plaster for Exterior and Interior Finish*

By F. S. Baker, F. R. I. B. A., President Royal Arch. Inst. of Canada.

I can easily recall the days when the only Portland cement came from England in very small quantities and at a prohibitive price. The production of the Canadian article saw the emancipation of the architects from the anxieties of masonry work in lime mortar, and to-day I doubt if there is a building material which the architect regards with more affection than Portland cement.

It is very gratifying to know that no matter how enormous the quantity of Portland cement required in the operations incidental to the development of this vast country of ours, the raw material is available to ensure the use of the Canadian product and protect us against the necessity of importing foreign material.

I think that so delicate a material as Portland cement should be shipped in better packages than jute sacks, and claiming an architect's prerogative, I would ask your consideration of the possibility of improvement in this direction.

There is a source of considerable anxiety and annoyance to the architects which I think your chemical experts might overcome with great benefit to everyone concerned. I refer to that ingredient in Portland cement (and all seem to be alike in this respect) which so badly stains any limestone or sandstone with which it comes in contact.

Owing to the kindness of the management of the International Cement Company at Hull, Que., I was given an opportunity, with several other architects, to visit their works and see the whole process of manufacture from the quarry from which the shale was mined to the jute sacks already referred to.

Part of the process was, of course, this crushed shale and clay in the large cylinders at a very high temperature, and it occurred to me then that the qualities which caused the staining of the stone might be some form of carbon which might be eliminated by a further burning or by some chemical process which would not injure the usefulness of the product. Of course we use various methods of overcoming this staining, such as painting the back of the stone and using some non-staining cement in making the mortar used next the stone, etc., but even with these precautions the stains sometimes get through. I have in my mind a very fine public building now being erected of Bedford stone, and large areas of the external walls of the building are ruined by this staining.

The subject of concrete will be well covered by various speakers at this meeting, but there is one feature which occurs to me. I refer to the injury which concrete in course of setting receives from any sudden jar. To obviate this where concrete is used for floors in steel frame buildings, I think the architect should provide additional steel sufficient to ensure a stiffness in the frames which would prevent injury to the concrete by the vibration incidental to the erection of any steel frame building. I have observed that concrete placed in moderate freezing weather, say 20 degrees and above, which is allowed to set fully without any vibration, seems to be as good as that set in non-freezing weather.

Portland cement has proved very useful in forming surfaces to resist water or tanks to contain fluid [illegible] terns, swimming baths, egg tanks, etc., but the success of this depends largely on the mixture. In a case like egg tanks, it is exceedingly important that the walls should be absolutely tight, as the slightest subsidence of the fluid causes the eggs at the bottom of the tank to be crushed.

For this reason concrete seems to be the ideal thing for floors which lie upon the earth, such as basement floors, or verandah floors, or sidewalks. As a finished floor for a building, however, I do not think a cement and sand or marble dust composition is satisfactory, and the same applies to staircases

Advantages of Portland Cement

Portland cement shows its greatest usefulness to the architect in the mortar which is now almost universally used in the laying up of brick walls. I mean cement mortar, one to three. A brick wall laid in such mortar and grouted with liquid cement grout every few courses, becomes as hard as solid stone, and as compared with concrete, the builder has the assurance of strength, from his knowledge of the soundness of the bricks and of their resistence to crushing. I have watched men cutting an opening through such a brick wall, and the hard bricks generally yield before the mortar. Such masonry is a great comfort to the architect. In it there is no danger of a weak spot, such as might occur in a concrete wall through the carelessness of the workmen. No matter what precautions he takes, the architect of a reinforced concrete building, must have some anxiety on this score until the building has been thoroughly tested, and while I say this I am a great admirer of the wonderful feats which have been performed in the erection of immense reinforced concrete structures, and I am satisfied that it is a practical building process. The use of cement mortar in the building of rubble stone walls is also a great boon to the architect, no rubble stone work should be attempted in anything but cement mortar, where cement is obtainable. The failures which I have seen in rubble stone work would in every case have been avoided if cement mortar had been used.

While the concrete block is a desirable article for a certain class of building, I have not yet seen any which could be satisfactorily used in a building which was to stand as an architectural effort in a conspicuous place. In saying this I do not include so-called artificial stone, which is a very admirable building material, and thanks to the cement in its construction, is now obtainable of the highest quality in any quantity. And you get it without delay. In this material, anything which the architect can design of a masonry character can be rapidly constructed and reproduced to an endless number. He is hypercritical who condemns this material because it is an imitation. I contend that it is a sound building material, which can be quite properly used where it is obviously artificial stone.

Of the several kinds of artificial stone, I prefer that which is formed of the same material all through, and not formed, in the main, of one kind of concrete and faced with another. There is apt to be a difference in the expansion and con- [illegible] article, as compared with that which is formed of the same material all through It is clear, however, that an architect [illegible] obtained in artificial stone in an effort to economize. On the [illegible]

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*Extract from paper read at the second [illegible] Cement and Concrete Association

Cement Plaster for Exterior and Interior Finish

A delightful material for use on the interior wall surfaces of buildings has developed recently, in plaster formed of white cement mixed with ground stones of different colors.

Of these, the most used is perhaps what is known as Caen stone cement. This is now used to finish the interiors of the public parts of hotels, hospitals, theatres, banks, stores, and even churches. It is applied much as plaster would be, and is laid off in courses jointed horizontally and vertically, just as real stone work would be. The result is almost a perfect imitation of real Caen stone work and is, as I said before, a delightful interior finish. On account of its plastic nature the most difficult ornamental work can easily be produced, cast from a carved model, which, of course, can be reproduced as often as desired. The color obtained is splendid, and while it is undoubtedly an imitation and more to be condemned on that score than artificial stone, an architect obtains in its use a most satisfactory result for his client. All the large cities in Canada, and I think I may safely say all the large cities in the United States, have prominent examples of the use of this material for interior finish. In most of these cases all of the interior trim, including the mouldings and ornament, are also formed in the Caen stone cement.

The use of cement has also made possible many embellishments for the exterior of the building, which could otherwise only be obtained at great expense. A whole wall surface may now be safely covered with cement plaster, either on masonry work or metal lath, and the craftsman feel assured that it will stay in position, while at the same time it may be enriched with scrafito ornament by the skilful carver. On the other hand, friezes protected by roofs or other protections, can be modelled in relief on the building quite as successfully as a frieze carved in stone and at much less expense.

Waterproofing Methods and Materials

Specific Application of Various Products to Different Conditions—The "Integral" System and the "Membrane" or Bituminous Shield Method*

By R. A. Plumb, Detroit, Mich.

There is a tendency for many of us to live on from day to day entirely unconscious that we are living in a world of wonderful changes. We are truly living in Nature's great laboratory, where physical and chemical changes are incessantly taking place and continually transforming our world.

Foremost among nature's agencies is water, and we have but to look around us to realize its activity, both as a constructive and destructive element of nature. The waves lashing our shores and continually changing our coast lines; the glaciers with their heavy mass, planing the rocks on which they rest; or our rivers, which are continually eroding their shores and changing their channels—are but suggestive of the different forms in which water is manifesting its activity.

The quantity of water resting on the earth's mass is estimated at thirteen hundred quadrillion tons, which would be equivalent to a universal ocean with a depth of nearly two miles, if the surface of the earth was a perfect spheroid. The great part of all animal bodies and of all plant life is water. It is not only a large composite part of all nature, but it continues to maintain life by supplying food, as the blood in the higher animals and as the sap in the trees. A living world without water would be impossible, as our earth would be nothing more in its activity than a metallic crust with no ability to give birth to organic life. We can truly agree with Pindar, who, back in the early days of Hellenic civilization, exclaimed "Water is the chief of all."

Realizing the destructive influence of water, we should, as concrete workers, be keenly interested in the methods and means of rendering our structures immune to its degenerating effects. Building materials in general, especially concrete, are decidedly porous and absorbent. Water is drawn into foundations from the surrounding soil, and due to the capillary nature of constructive materials, it ascends gradually and finally permeates the entire structure, producing damp, clammy walls which constantly foster and spread disease. It is apparent, therefore, that proper waterproofing not only prevents the gradual decay and disintegration of structural materials, but goes further to establish more hygienic conditions for the benefit of humanity in general. We are all willing to grant that if we can add permeability to the strength, durability and fire-resisting properties of concrete, we have at last produced a perfect building material.

Classification and Application of Materials

Due to the fact that the subject of waterproofing is at the present time in somewhat of a confused condition, and practically every manufacturer of a waterproofing product is zealously pushing his materials as the "only perfect waterproofing," and the consumer has no general literature on the subject otherwise than what is applied by the manufacturer, I will endeavor in the following to outline and classify the different waterproofing materials and indicate their specific application to different waterproofing conditions.

In recognition of the distinct differences between damp-proofing and waterproofing in its literal interpretation, it is advisable to consider these subjects as two separate divisions of the general subject of protecting structures against the disintegrating action of water. Damp-proofing should be confined to the consideration of the methods and processes of keeping water and dampness out of the superstructure of buildings, while waterproofing should deal particularly with methods of treating and insulating substructural work subject to hydrostatic pressure, and also to those types of construction designed for retaining water. Damp-proofing products have absolutely no application to waterproofing conditions, and manufacturers of strictly damp-proofing products, who are pushing their materials for waterproofing conditions, are only bringing discredit and encouraging scepticism on the whole subject of waterproofing.

The almost innumerable number of materials on the market for damp-proofing purposes may be simply included in three distinct classes, viz.:

(1) Transparent coatings;
(2) Opaque cement coatings;
(3) Special bituminous coatings.

Transparent Coatings—In this class should correctly be included the products and processes, the application of which does not change the original physical appearance of the surface treated.

The old Sylvester process, although now practically obsolete, should be given some mention as an original effort in this line of damp-proofing. This process involves alternate treatments of the surface with solutions of soap and alum, and depends for its efficiency upon the formation of a greater or less amount of the aluminum salts of the fatty acid contained in the soap, which possesses physically, a very distinct but temporary water repellent action. This is not economical, as it is necessary to repeat the operations a number of times to produce sufficient insoluble soap to show any efficient repellent action.

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*Read at the Second Annual Convention of the Canadian Cement and Concrete Association

The treatment of the porous surface by means of hot parafine should also be included in this class. This is the process that was used for treating the obelisk which was brought over from Egypt and set up in Central Park, New York City, and which soon began to show very evident signs of disintegration when subjected to our climatic conditions. In this process the exposed surfaces are first very carefully heated by means of artificial heat, and coated with melted parafine applied with a brush. By this means the parafine penetrates to a considerable depth before it chills and leaves the parafine deposited in the pores. Comparatively successful results can be obtained by this method, yet the expense makes its use quite prohibitory in the majority of cases.

Most interesting of this class are the great number of transparent liquid coatings that are applied to the surface with a brush, like paint. These products appeared on the market very shortly after the absorbent nature of a concrete block was recognized, and were offered as infallible remedies for this detrimental feature of concrete. It is very unfortunate that a greater number of the manufacturers did not deem it necessary to tes ttheir materials to determine their efficiency, but chose rather to advertise them broadcast, as perfect waterproofings, and reap the benefit of the early business in this line. Analyses made in the writer's laboratory have shown that in the greater number of cases, these products contained nothing more than a low melting point parafine or wax, fluxed back in a light volatile oil, and depending for their efficiency upon the deposition of the wax or parafine in the pores of the concrete. We have found so-called waterproofings that contained within themselves over 95 per cent. of volatile constituents, that acted purely as temporary solvents and carriers of the very small amount of solid base. It is quite unfortunate that the word waterproofing has been associated with these products, as it has naturally resulted in establishing doubt and scepticism on the entire subject.

The theory involved in these products is entirely correct, viz., the deposition in the pores of the concrete of a permanent water repellent base which will overcome the characteristic positive absorbent nature of the material and impart a negative repellent nature. The trouble has been that insufficient investigation has been given to the character of the material to be used for such a product, and it is only within the last year or two that a very limited few progressive manufacturers have given the necessary technical and careful scientific investigation to the subject and have been able to produce by synthetic means, water repellent bases which show the maximum solution in volatile vehicles, and in two coat work, do overcome the detrimental nature of porous surfaces. It is therefore encouraging to note that this small, but yet important part of damp-proofing, is being solved and satisfactory products are available.

There is a very distinct field for such coatings, as they are the only products which we have for treating the exterior surfaces of porous stone, to preserve them from decay, due to the absorption of water and other atmospheric impurities which result, not only in the unsightly staining of the sensitive stone, but a general surface disintegration due to the disruptive force manifest by the expansion [illegible] in the pores on freezing.

Opaque Cement Coatings—Nearly every [illegible] practiced coating his cement work with a plain [illegible] and has experienced the difficulty of obtaining [illegible] and also has observed the tendency of the coating to absorb water. A few of the progressive manufacturers [illegible] made a special study of the exact requirements [illegible] surface, have produced coatings which are made up from a Portland cement base and which show a perfect bond on the surface coated and are perfectly repellent and damp-proof. These products contain no oil and possess none of the characteristic qualities of oil paints. It is well known that an oil paint has no application to a concrete surface, as the vegetable oils used react with the alkali in the cement, forming a soap and desulting in the disintegration of the coating. Oil paints also dry with a distinct gloss, which is very objectionable on a concrete surface where the coating should retain the integrity and characteristic texture of the surface coated.

The cement coatings have a very general application for uniforming cement surfaces, such as stucco, cement blocks, etc., and replace the somewhat cheerless and unattractive surfaces with a soft-toned surface which is thoroughly damp-proof.

Special Bitumens—The special bitumens differ from the products of the preceding classes in that they are not applied to the exposed surface, but to the interior of the exposed wall. Such products are black in appearance and are made up from the various selected waterproof gums. They are applied to the interior of a wall, with a brush, and besides providing a continuous membrane in the wall which will act as an insulator against the ingress of water, they provide a solid bond for a coat of plaster applied directly on the coating. There are a great number of black paints on the market which are recommended for this purpose but which have shown very unsatisfactory results, in that they do not possess the durability, the elasticity and "tackiness" which are necessary essentials of such a material.

These products very obviously serve an economical purpose in eliminating the necessity of furring and lathing. By this construction the cubic area of available space is increased and all the disagreeable features of the air space are eliminated. Although the film is a fairly good non-conductor, it has not the same insulating efficiency as an air space, and is not recommended where the results would be unsatisfactory due to serious condensation on the inner surface.

It is the present day engineering practice to waterproof substructural masonry or structures designed to retain water by one of the two following methods, viz.:

(1) "Integral" or rigid method.

(2) "Membrane" or bituminous shield method.

Both of these processes have very distinct characteristic features and should receive very careful individual consideration.

According to the "integral" method, a waterproofing compound is incorporated in the concrete mass, rendering same waterproof within itself. By the "membrane" system, the concrete work is insulated from contact with the water by interposing a continuous, waterproof, bituminous shield.

Preliminary to a brief discussion of the merits of these two methods, it is well to indicate briefly why concrete requires waterproofing. The [illegible] is permitted by the existence of minute, capillary pores throughout the mass. That such porous structure cannot be avoided, arises from the elementary nature of concrete itself. In the composition of concrete, water fulfils two distinct functions. It is required chemically, for the processes of solution and [illegible] not being able to assimilate all the water, the excess is removed by evaporation, and, as the water is incompressible, [illegible]

Integral Method

[illegible]

physical condition in which they are added to the concrete, viz.:

(1) The finely powdered dry compounds that are added to the dry cement.

(2) The compounds, either in liquid or paste form, that are added directly to the water that is used to temper the dry mixture of cement and aggregate.

The compounds of the first class are usually homogenous mixed with dry cement, in the proportions of two per cent. These compounds are chemically, hydrated lime with a greater or less amount of the lime salts of fatty acids. These lime soaps were undoubtedly originally chosen as waterproofing compounds, due to their characteristic water repellent property. A careful study of the subject of "intergal" waterproofings will emphasize that the very first essential for successful results, lies in obtaining an even, homogenous distribution of the waterproofing compound. It is a chemical axiom that in any process endeavoring to produce a perfect mixture, it is fundamentally essential that the body to be distributed must be of such a nature that it will be readily mixable with the distributing medium. On the basis of this fact, it is quite evident that the repellent properties, possessed by these dry compounds, are a considerable disadvantage in obtaining an even distribution. It makes very little difference how careful an original effort be made to dry mix a repellent compound with the dry cement and then with the dampened sand, as soon as the water is added the repellent property of the compound will manifest itself and as the fluidity of the concrete increases, the resistance to flow throughout the mass will decrease and there will be a tendency for the repellent compound to expel itself from portions of the mass and be concentrated in other sections, thereby making an even, homogeneous deposition impossible. Although the repellent feature is an excellent property for a compound to possess when in place in the mass of concrete, its very nature makes the even distribution difficult and thereby defeats its intended purpose.

In the case of compounds that are added directly to the water, there is no difficulty in obtaining an even distribution, as they have had the advantages of the water as a vehicle or carrier to evenly distribute them. As far as the homogeneous deposition is concerned, it should be quite evident that the compounds of the second class that are originally mixable with water, have a decided advantage over the dry compounds of a repellent nature. An acceptable compound for this class of work should also contain no organic constituents or other materials that will in any way interfere with the strength of the concrete, as it should not be necessary to sacrifice strength to obtain waterproofing efficiency. A recent report of one of our universities gave results which indicated a loss of over 50 per cent. in the strength of the concrete, due entirely to the presence of the emulsified oils contained in the compound.

The "integral" method of waterproofing had a very general application to waterproofing conditions. It is only limited in particular cases where there is a liability for the continual development of cracks in the work, which would, of course, destroy the waterproofing efficiency. The "integral" method is very universally employed for substructural work of various natures and to cisterns, reservoirs, etc., which are designed for containing water. The waterproofing compounds can be used throughout the mass of the concrete, or in cases where this procedure would be impractical, due to the cost of the waterproofing, it can be concentrated in a plaster coat on the surface of the structure. Rather than discussing fully the essentials necessary to be considered in applying the "integral" method, I have briefly outlined in the following a typical specification showing the application of the "integral" method of waterproofing in the form of a waterproof coat, as it should be used to correct the percolation of water into the basement of a completed building. I have chosen this specification as it emphasizes particularly the application of the "integral" method of remedying leaky conditions in substructures already erected, where re-excavation would be entirely too costly and, in some cases, impossible.

Typical Specification for "Integral" Method

1. Intent—It is the intent of these specifications to correct dampness due to percolation of water through walls and floors in basements in buildings not properly waterproofed during construction.

2. Method of Procedure—Water-tightness shall be secured by plastering the inner surface of damp walls and floor with an unbroken continuous coat of cement mortar to which...... .... as manufactured by .... has been added.

3. Preparation of the Coating—The waterproofed cement mortar shall be prepared by thoroughly tempering, to required consistency, a dry mixture of one (1) part of cement to two (2) parts of sand with water to which .... has been added in the proportion directed by the manufacturer. The sand shall be clean and spherical and well graded from coarse to fine.

4. Preparing the Surface to be Coated—Before plastering cement mortar on old concrete, the surface of same shall be treated as indicated in the following:

(a) The old surface shall be cleaned thoroughly with a heavy wire broom so as to remove all dust and dirt. A jet of steam shall be employed to clean the wall, if available.

(b) To the mechanically cleaned surface, apply with a large brush a liberal coat of 1: 10 solution of hydrochloric acid. Allow the acid to remain until it has exhausted itself, which will require at least ten minutes. A second liberal coat of acid solution shall be applied before removing the first. A third coat shall be applied if the two applications have not satisfactorily exposed the aggregate and entirely removed the skin of hardened cement.

(c) With a hose under good pressure, slush the surface in one direction so as to remove the salts resulting from the action of the acid. Continue the slushing until the salts and all loose particles are removed and the old concrete is thoroughly soaked to its full hygrometric capacity.

(d) To the cleaned and saturated surface, apply with a strong fibre brush a coating of pure cement, mixed to the constituency of thick cream, with water to which............ ....has been added in the proportion directed by the manufacturer. Rub in vigorously so as to fill all the crevices and cavities produced by the action of the acid.

5. Application of Coating of Walls—Immediately after applying the above slush coat, the first coating of waterproof cement mortar shall be applied (thickness, ⅜-inch) directly upon the slush coating and well trowelled into every void or crevice of the surface. Before this first coat has reached its final set, a second and final coat shall be applied to an equal thickness, so as to make the full average thickness three-quarters of an inch. The finish coat shall be floated to an even surface and subsequently trowelled free from any porous imperfections. If the conditions of the work make it impracticable to apply finishing coat before scratch coat has set, the latter must be dampened and slush coated before finishing coat is applied.

6. Basement Floors—The floors shall be treated and prepared exactly as indicated above and finished with the waterproofed mortar to a thickness of two (2) inches. Special care shall be exercised to bond the wall coating to the floor coating, so as to make the waterproof coat absolutely continuous.

The "Membrane" or Bituminous Shield Method

The "membrane" system of waterproofing differs distinctly from the "integral" in that it does not attempt to treat the concrete, but rather to insulate it from contact with water by enveloping the structure in a continuous bituminous shield. The fact that the "membrane" is not a unit or rigid part of the structure, permits a certain freedom of movement and action in the structure, without impairing the efficiency of the waterproofing. This feature of the "membrane" system makes it most suitable for waterproofing work not fully reinforced and liable to settlement or subject to vibration or shock, such as railway bridges, culverts, etc.

It was early practice to simply coat the surface to be waterproofed with hot tar or asphalt, but it was soon evident that this was not sufficient, as the coating would crack with any movement in the wall. It was therefore necessary to employ some material in addition to the bitumens to contribute the necessary toughness and tensile strength. Burlap and coal tar felts have been extensively used for this purpose, and some very satisfactory waterproofing operations have been carried out with such materials. For the last few years considerably more attention has been given to the nature of the waterproofing felts, and as a result there are now on the market specially manufactured felts which are both saturated and coated with bitumen and possess greater pliability and strength. By means of these felts more perfect membranes can be constructed as the strength and toughness of the felt permits greater distortion and twisting to accommodate it to the design of the work.

The bitumens most generally used for cementing the felt together in constructing the membrane are coal tar pitch, commercial asphalts and special asphalt compositions. Although coal tar pitch, on account of its cheapness, has been and is still being very extensively employed for waterproofing, there is considerable controversy among engineers regarding the relative value of the coal tar pitch as supplied to-day by the more modern methods of gas production and the older process in vogue when pitch was first used for waterproofing.

The asphalts are more suitable for waterproofing, as they possess greater elasticity and permanence. In selecting an asphalt for waterproofing purposes special care should be taken to obtain a material of as low a melting point as the nature of the work will permit, as it not only ensures greater elasticity when subjected to cold temperature, but works much more freely and easily in applying. The special asphalts are usually manufactured from a hard hydrocarbon, such as gilsonite, tempered with petroleum residiums to impart the necessary elasticity. The residuums used in the preparation of these asphalts should preferably be strictly asphalt bases and contain the minimum percentage parafine, which, being of a lubricating nature, impairs the necessary binding properties of the asphalt.

The application of a bituminous membrane to any structure should have the same careful attention as any other important point of engineering design. Every job has its particular requirements, which should be carefully interpreted and the design fully suited to meet the individual conditions.

Considerations in Highway Bridge Work

Concrete no longer an experiment—Experience of the County of Middlesex, Ont.—Importance of Skilled Design and Construction

By Chas. Talbot, County Engineer of Middlesex

In Ontario, previous to 1874, the bridges on highways were almost all constructed of wood. From 1874 to 1895 many of the larger bridges were replaced with what were then considered permanent bridges. They consisted of quarry stone abutments, and piers, costing from $9 to $12 per cubic yard, and iron and steel superstructures with wooden joists, floors and hand rails. In Western Ontario a large number of these were built, mostly well designed and well erected. They were built to carry an equally distributed load of 80 pounds per square foot floor surface, and a concentrated load of five tons on two axles at ten-foot centres.

Between 1874 and 1891, eighteen of such bridges were erected in Middlesex county, sixteen over the River Thames and two over the Aux Sauble river, at a total cost of $227,000. They were designed with a large factor of safety, consequently they withstood the heavier traffic they are now subjected to, but they are too light to be floored with concrete. About 1896 the first concrete abutments and piers were built. At this time concrete was looked upon as an experiment, and stone work, even at an advanced price, was preferred. Soon, however, concrete was adopted generally, and in 1899, highway bridges were built with steel superstructures, designed to carry concentrated loads of 10 to 15 tons; supported on concrete abutments and covered with concrete floors. At this time, they considered these structures permanent, and they are splendid works.

In 1903, short span concrete arches were built extensively. Then followed in quick succession: reinforced arches, reinforced beam bridges, reinforced abutments—until at present reinforced concrete is claimed to be the only permanent job, and whether permanent or not, one thing is sure, that the remaining wooden bridges must be renewed in the very near future, and in their renewal, reinforced concrete is going to be used to a very great extent.

Skilled Design and Construction

Such being the case, and knowing that even the poorer classes of work hang together and will remain with us, it behoves us to look well at the details of the work to be undertaken, to see that the work is well done and that the structures erected are attractive in appearance, and substantially built in every particular.

A municipality should employ an experienced man to design their work. If the work is done by day labor, employ an experienced foreman, who will follow in every respect the design decided upon and carry out the plan and specifications. In no case should a foreman, inspector or contractor alter the engineer's plans. If they discover something incomplete or that they consider wrong, they should notify those in charge and the engineer should be consulted. If he is a man you should employ, he will welcome the criticism and will admit his mistake if he has made one, and will know how to rectify it, so as not to interfere with other parts of the work

If you do your fork by contract, employ a reasonably efficient contractor and an experienced inspector, if you can get one; if not, at least get a man who will understand perfectly the plans and specifications and who will follow instructions given.

With an engineer and an inspector that understand their work, and a good contractor, success of your undertaking is assured. There is absolutely no doubt as to the effectiveness of reinforced concrete when properly handled. Notwithstanding this, there are few jobs erected from plans prepared by me that are the success I would like; their strength is all that could be desired, the finish is rough and uneven in color, giving the whole work an objectionable appearance. Out of the large number of structures I have designed, few indeed are finished in accordance with the plan they were supposed to comply with. Only in two or three instances has the details of the finished work corresponded to the plan. The difficulty is the lack of inspectors who understand the plan, and of contractors who understand the work. However, we need not be surprised at these results when we know few contractors have [illegible] more than [illegible] bridges, and the great majority of them, but one. Our men are improving, and this year I hope for much better results.

I have said little or nothing about the advantages of concrete. At this stage of its development the usefulness is universally admitted. I do not consider it as being in opposition to steel structural work, each is incomplete without the other, and an experienced engineer on highway work can

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*Extracted from paper read at [illegible] Cement and Concrete Association.

readily determine whether a steel superstructure, an arch, or a reinforced concrete superstructure, could be most advantageously used.

Under exceptional conditions, long span arches can be used within reasonable cost. In my practice I have used reinforced concrete slabs up to 16 feet span; reinforced concrete beam bridges up to 36 feet span; reinforced concrete arches up to 75 feet span; steel superstructures with concrete floors and concrete substructures in spans from 20 feet to 240 feet.

Since 1901, Middlesex county has spent $189,400 on bridge work alone, an average of $23,000 per year. In every structure erected concrete has been used, and has given complete satisfaction. The first concrete floor laid, 1902, is as perfect as when the maker left it.

I believe it is not in the interests of cement manufacturers or concrete workers to attempt to compete in price with steel highway work. The properly designed, well erected and artistically finished reinforced concrete structure is so much superior to the ordinary steel bridge that there should be no comparison in first cost. In my opinion it is this unequal competition that is causing the failure in concrete structures in that on spans of any considerable length the designer cannot compete with steel under present conditions and allow a sufficient factor of safety.

A superior article commands a superior price. Just as the old wooden bridge was not abandoned because timber became scarce and expensive, but because the people demanded a superior article at an advanced cost, so steel bridges, to a certain extent, are being superseded by reinforced concrete, not because it is less expensive, but because its durability is established.

It is well known that both steel and concrete bridges are being designed and erected by men who have neither scientific or practical knowledge of the subject. Taking this into account, and also the fact that reinforced concrete has been in use but a short time, the wonder is that more structures, especially of concrete, have not failed. The public should be protected from this danger, and the least the Legislature could do, and what there is great necessity for their doing, is to establish some central supervision of all highway designs, before they are permitted to be used.

I have referred to the fact that the work done on reinforced concrete was not as good as it might be. However, in every case, the structures built are strong and substantial looking, so much so that the municipalities that have erected them want more of them. Wherever possible, I have no hesitation in complying with their wishes.

Among the Exhibitors at the Cement Show

Features of interesting exhibits at London—Noteworthy Indications of Steady Progress in various lines of constructional materials and appliances

London Foundry Co., London, Ont.—Showed an attractive line, including several kinds of contractors' wheelbarrows. The company manufacture wheelbarrows, hydrants, valves, etc.

U. S. Cypsum Company, Chicago, Ill.—The company showed samples of their products and a number of interesting photos of notable work in connection with which they had been specified.

London Engine Supplies, Limited—This exhibit comprised gas engines, pulleys, hangers, shafting, fittings, valves and other lines for which the company report an excellent and growing demand.

Roman Stone Company, Limited, Toronto, Ont.—This exhibit was in charge of Mr. A. J. Aldington, who showed samples of the product and a number of excellent photographs of important buildings in which Roman stone was the principal material of construction.

Alfred Rogers, Toronto—The representative of the independent cement companies had an attractive booth and samples of cement on hand, with several representatives looking after his interests. Mr. Rogers, who spent a good deal of time at the Show, is particularly optimistic concerning the future of the cement industry in general and the prospects of the independent concerns in particular.

C. S. Wert, Kendallville, Ind.—The "Perfect" brick machine, which was demonstrated by Mr. Wert, the inventor and manufacturer, is worthy of more than passing mention. The machine can be operated either by the hands or the feet, and the brick is produced by one operation of the lever. The outstanding merits of this machine, according to the manufacturer, are its rapidity, simplicity and durability. Mr. Wert contends that it is the fastest machine on the market.

Peerless Brick Machine Company, Minneapolis, Minn.—The merits of the Peerless one-man cement brick machine were demonstrated by Mr. L. V. Thayer, president of the company, who was in charge of the exhibit. The machine has a capacity of 12,000 brick a day. The company claim the "Peerless" to be "a complete brick factory in itself." The cement brick made on this machine are always of a uniform size, being cast in accurate steel moulds and delivered face up.

John T. Hepburn, Toronto, Ont.—The "Little Wonder" cement block machine, which came in for a good deal of favorable comment at the Show, can make any size, shape, square or angle block required for a building. It is built on an adjustable, sectional plan. The blocks can be made to face on the four sides if required. Two veneering blocks can be made at one operation, as this is a side face machine. Another feature of this exhibit was the new State concrete mixer, for which Mr. Hepburn is the manufacturer and sales agent for Canada.

Wettlaufer Bros., Toronto and Mitchell, Ont.—This was an interesting exhibit which well repaid a visit. Among the machinery shown were the company's No. 1 mixer wiah stationary hopper; a traction mixer with automatic lift hopper; sidewalk mixer; new improved all-steel mixer; all-steel hand mixer; new six-brick machine, and various types of block machines. No better argument could be adduced in favor of the Wettlaufer mixer than the fact that in the city of Toronto alone, during the past year, the company has sold 30 of these machines. And what is more, the names of the buyers are on hand to prove it.

Trussed Concrete Steel Company—An exhibit of special interest was the united steel sash shown by this company. This sash is about the latest thing in this kind of construction we have seen. It is made of high grade rolled steel sections and is designed to give the greatest strength and maximum lighting area. The frame is built so that the full section of the steel is developed at all points. The special ventilator frame has two continuous contact surfaces for keeping out draughts and rain. A special improved locking device ensures absolute tightness all around openings. The advantages claimed by the company are rigidity, maximum lighting area, weatherproofness, workmanship and economy a hard combination to beat.

The Scott Machine Company, Limited, London, Ont.—The "London" friction clutch hoist was the feature of this exhibit. This appliance was designed by the company to meet the demand for a cheap, simple and durable hoist to be used in connection with gas, gasoline and oil engines. Among the many uses for which this hoist is specially adapted may be mentioned contractors' work, bridge building, pile driving and sewer construction. Another line which the Scott Machine Company exhibited were their excellent engines, the simple and substantial construction of which are worthy of special commendation.

Merillat Culvert Core Company, Winfield, Iowa—An exhibit of great interest to many of our readers was the Merillat adjustable core, exhibited by the Merillat Culvert Core Company, of Winfield, Iowa. This core is adjustable to any size of culvert between 20 and 48 inches and, according to the company, the only form for building concrete culverts that is adjustable, expansible, collapsible and portable. To facilitate handling, the machine is equipped with wheels which are tucked inside when not in use. They are brought out, automatically, without a pound of weight on the core. The form is always round, locked and braced at any size. It is claimed that contractors can save half the usual time taken in making, putting in and taking out forms. Perhaps the strongest argument in favor of this invention is its simplicity. The Merillat machine has the Edison stamp about it, and appeals to us as an excellent proposition.

Down Draft Furnace Company, Limited, Galt, Ont.—This concern showed the "Majestic" and "Model" coal chutes and sectional metal window frames for cellar windows. The "Majestic" coal chute is a new device to take the place of a basement cellar window, through which coal, wood, etc., are put into the basement. It is made with a heavy cast iron frame and door, and the chute portion is made of heavy steel. When the door is opened it locks, and holds itself in position, and protects that portion of the basement or wall above the chute. When closed, it locks itself, and is positively burglar proof. The "Model" chute is similar in design to the "Majestic," except that it is fitted with rubber glass, which admits the light to the basement. These coal chutes are made in three different sizes. The sectional metal window frames are made in four sizes and bolt together in the corners. They are designed for basements, and are made of the best quality grey iron, 5/16-inch in thickness and 7 inches wide.

Somers Bros. Manufacturing Company, Urbana, Ill.—An evolution in concrete machinery that is worthy of special mention is the Somers pressure block machine. One of the most noteworthy features of this machine is its ability to handle a very wet mixture. Another advantage is the ingenious combination of levers by which it is possible to obtain a pressure equivalent to 30 tons. The machine makes hollow block, 8, 10, and 12 inches wide, and veneer and two-piece block 2½, 3, 4, 5 and 6 inches wide. The Somers machine also makes a special block for concrete silos having a groove on the top for the accommodation of reinforcing wires. With this block the farmer is able to effect a great saving over monolithic work. The cost of the machine is very moderate, slightly in excess of the hand tamped machine, the difference between the two being saved in one season, according to the manufacturers. It is the intention of this company either to manufacture in this country shortly, or to lease the patents to a Canadian company.

London Concrete Machinery Company—An interesting feature of this exhibit was an entire plant in operation, manufacturing cement drain tile. This included a special type of concrete mixer, gravel crusher and complete machine for manufacturing cement drain tile in all sizes from 3-inch to 16-inch in diameter. Although machines of this type are well known in the United States, they are practically new to most Canadians. The company had on exhibit two automatic concrete mixers which have been on the market for about one year. These two machines are now well known and need little mention here. In addition to these, there were two new types of Standard batch mixers, one which mixes 7 feet at a batch and another which mixes 12 feet at a batch. The company informed us that they manufacture two larger sizes, one a 20-foot and another a 30-foot. These two batch mixers are very complete in their equipment. Other features of this exhibit were London adjustable silo curbs, face-down adjustable block machines, concrete brick machines, sewer pipe and tile moulds, sill, step and window cap mould, lawn vase moulds and ornamental moulds of every description; cement working tools, hoisting equipment, wheelbarrows, and almost every conceivable device for the working of concrete.

Canada Foundry Company, Limited, Toronto, Ont.—Showed their No. 1 Koehring mixer. This machine has a capacity per batch of 14 feet and a capacity per hour of 120 street yards. One of the advantages of the Koehring mixer is that the services of experts are not required in its operation. There are no complicated parts requiring constant adjustment. Simplicity is embodied wherever practical. The mixer is self-propelling. It is equipped with an automatic charging bucket of sufficient capacity to lift the whole batch at one time. The mixing blades are placed at an angle with the axis of the drum in such a manner that there is a clearance between the end of each blade and the head of the drum so that there is no pocketing of the material. The blades are so arranged that they carry the material alternately from end to end of the drum and break it over against the heavy heads. The lifting and pouring and the unequalled end-to-end motion of the aggregates is not the only mixing the material receives. The inner end of the discharge spout, when not in discharging position, is tilted downward. Material carried up by the mixing scoops falls on this spout and is then deposited in a constant sheet or flow the entire width of the spout, to the bottom. Here it strikes at right angles to that from the lifting and pouring action from the sides, and the flow, of aggregates from the end-to-end mixing. This makes three independent mixings in the Koehring mixer and each one is a known, positive mixing. The traction drive on the No. 1 machine is connected with both rear wheels, which are provided with cleats, and is sufficiently powerful to move the machine up grade. The Canada Foundry Company make all sizes in this machine, from a mixer capable of turning out 3 cubic yards per hour to one of 30 cubic yards per hour.

Concrete Blocks made Without Sand or Gravel

Another striking demonstration of the merits of concrete for building purposes is found in the transformation which is taking place in connection with the industrial village of Mineville, near Port Henry, N.Y. The village is located near some rather extensive mines and is in the heart of what was once a great forest, but the collection of wooden shacks of which it was originally composed is gradually being replaced by buildings of concrete. One of the factors which was influential in leading to this rather extensive use of concrete was the possession by the mining company of a rather superior aggregate in the shape of the "tailings" or residue left after the separation of the ore. An immense heap of these tailings gives a practically inexhaustible supply of the aggregate, and tests have demonstrated that cement mixed with the use of tailings in the proportion of one to five produces a superior concrete block without the addition of sand or gravel.

According to 1909 labor statistics for Great Britain, the number of unemployed in the building trade was 11.7 per cent., and in the engineering, 11.6 per cent.

Trade News from Montreal

Building Figures for 1910 Show Large Percentage Increase—Contractor Lyall's Plans for Extensive Boulevard

Montreal Office of the "Contract Record."
April 4th, 1910.

Building figures just received from Inspector Chausse's office evidence a very satisfactory progress in building circles during the month of March. In all, 222 building permits were issued. Sixty-four of these permits were for new buidling construction, valued at $587,239, while alterations to existing buildings brought the total to $676,804. It is interesting to note that a reference to the building records show that for the same period in 1909, 189 permits were issued, aggregating $376,275. The permits taken out for new buildings at this time were valued at $283,400, so that the new building figures for March, 1910, show the rather startling advance of 103 per cent. A further comparison of the building statistics extended over the months of January, February and March show that during this period in 1909 the total value of permits issued reached $731,725. Up to the end of March, 1910, the permits issued totalled $1,093,244, showing an increase for three months of $361,519, or 49 per cent.

Wm. Lyall's Plans for Extensive Boulevard

Mr. William Lyall, a member of Peter Lyall & Sons, Limited, has recently submitted to the Montreal Board of Control plans for a suggested method of overcoming the congested condition of the street car line system throughout the city and at the same time providing an extensive and handsome boulevard.

The plans submitted by Mr. Lyall show a boulevard 191 feet 8½ inches wide, and also an alternative scheme 173 feet 6½ inches wide, having a driveway on either side with two or four car lines in the centre, extending from one end of the city to the other, and taking in Ontario, Berthelot, Burnside, St. Luke, Western avenue, Cote St. Luc road, and Sherbrooke street west. Eventually the boulevard could be extended to Bout de l'Ile in the east, and Ste. Anne de Bellevue in the west

The plans further make provision for the establishment of a public park along the route of the boulevard at the junction of Ontario street and St. Lawrence main. Here it is suggested could be found sites for a new City Hall, Court House, Public Library and Art Gallery or Museum.

Mr. Lyall suggests that the new driveway be termed the "Strathcona Boulevard" as a compliment to "Canada's Grand Old Man." In matter of cost, it is figured that the scheme would cost approximately $11,000,000, out of which $9,500,000 would go to purchase the land and the balance would be required for treating the surface. Two different scales of width for the boulevard are proposed, the one to be selected depending on the amount of money to be expended. The larger one would afford the advantage of allowing for an extra pair of car lines in the centre, for express traffic.

The details of the project, as submitted to the Board of Control, also point out many improvements that could be adopted in regard to the drainage system, and the water, gas and electric mains.

First Section of New Subway

The Montreal Street Railway Company are at present applying to the Quebec Legislature for subway construction privileges within the city limits. Mr. W. G. Ross states that the first section will be constructed along St. James street, from Craig street to Victoria Square. The estimated cost for this work is $1,500,000.

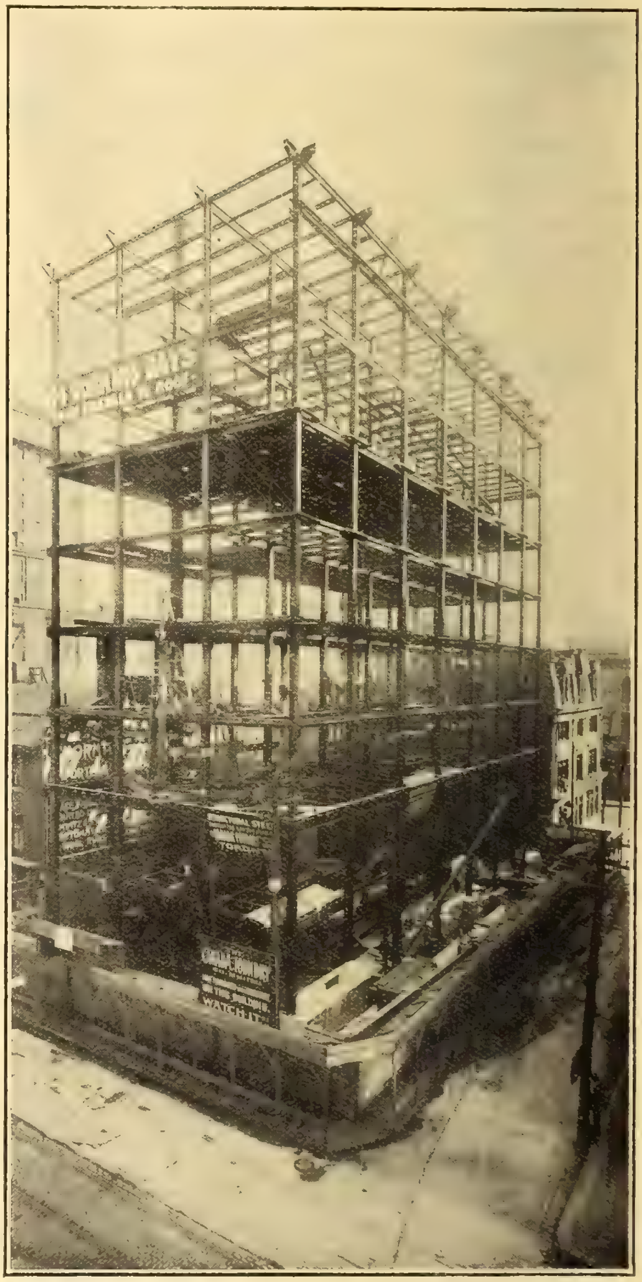
A very interesting display of the plans submitted in competition for the new Dominion Express Building, to be erected on St. James street this spring, is at present being made at the rooms of the Architects' Association, Province of Quebec, 5 Beaver Hall Square. The exhibition includes the elevations and floor plans submitted by the successful architects, E. and W. S. Maxwell.

A Record for Speedy Construction

Two or three weeks ago a large sign was placed on the hoarding surrounding the site of the new Standard Bank at the corner of King and Jordan street, Toronto, which read as follows:

"The Canada Foundry Company have promised quick erection on this building. Watch it grow."

The building in question is an eight-storey steel structure, the steelwork being manufactured and erected by the Canada Foundry Company. The rapidity of its erection was witnessed and commented upon by thousands of people who watched its progress. Only 13 working days were taken, from the start at the ground floor to the completion of the roof on the eighth floor. The Canada Foundry Company claim this to be a Canadian record for quick construction.



Showing Steelwork for New Standard Bank, Toronto.

Leading Canadian Contractors

McPhail & Wright Construction Co., Ltd.
Sault Ste. Marie Ont.

The McPhail & Wright Construction Company, Limited, of Sault Ste. Marie, Ont., who are carrying on an extensive business in general contracting, making a specialty of concrete work, were incorporated March 1st, 1909, with a capital of $50,000, the principal shareholders being Mr. D. P. McPhail and Mr. Kenneth Wright.

Mr. McPhail, the president of the concern, has been a resident of New Ontario for many years, having gone to Sault Ste. Marie from Tiverton in 1876, ever since which date he has been actively engaged in the contracting business. In 1896 Mr. McPhail entered into partnership with Mr. Thos. McCarty, Toronto, and for a period of four years carried on a successful contracting business in Kenora, Ont., under the firm name of McPhail & McCarty. Mr. McPhail returned to the Soo in 1900, and there carried on business until the incorporation of the present company. Mr. McPhail's activities are not confined entirely to the McPhail & Wright Construction Company. . Among other things he is also a director of the Sault Builders' Supply & Cartage Company, Limited, and a member of the Council of the Board of Trade. He has a reputation for being well schooled in all the practical phases of his work and is conceded to be an authority on building construction.

Mr. Kenneth Wright, vice-president and secretary-treasurer of the company, is a native of Banffshire, Scotland. He came to Canada in [illegible] and settled in Paisley, Bruce county, Ont., where he at once made connections with the building trade. Three years later he took his first contract in Owen Sound, returning the following year to Paisley, after which he carried on a successful contracting business in Bruce county for some years. Mr. Wright went to Sault Ste. Marie in 1900 and conducted a general contracting and builders' supply business on his own account until the incorporation of the company with which he is now associated. Like his partner, Mr. Wright finds time to devote to other interests. He is president of the Builders' Supply & Cartage Company, Limited, and a director of both the Sault Ste. Marie Coal & Wood Company, Limited, and the St. Joseph Island & Soo Line Steamship Company, Limited.

Mr. D. P. McPhail,
President McPhail & Wright Construction Company, Limited

Among the contracts completed by the firm last season are the $45,000 high school at Sudbury, Ont., the $20,000 building for the Bell Telephone Company, at Sault Ste. Marie, and about five miles of cement sidewalks at Thessalon Ont. In addition to their general contracting business, they operate a sand pit, gravel pit and one of the largest quartz quarries in Canada, on the line of the Algoma Central & Hudson Bay Railway. The company's offices and warehouses are centrally located on the river front at the foot of Gouin street, Sault Ste Marie.

Mr. Kenneth Wright,
ice-President and Secretary-Treasurer.

Contractor's Useful Invention

There is at present being placed on the Canadian market the Pauly tile and pipe machine, the invention of Mr. A. A. Pauly, of the Concrete Stone & Sand Company, Youngstown, Ohio, an experienced concrete contractor and machinery expert. On this machine is manufactured concrete structural tile for floor spans, partitions, etc., also concrete sewer pipe and fittings of various sizes and shapes. These fireproof tile are made of wet mixture of cement, and aggregate of sand, gravel or crushed stone, and poured into moulds, then steamed and ejected into perfect forms Recent tests made of these materials in regard to compression, fireproof qualities, etc., show them to be capable of enduring the most severe temperature and possessing a wonderful crushing strength. The following details of manufacture outline the advantages claimed from these products.

The concrete mixture is prepared to the consistency of a paste of Portland cement and a suitable granulated aggregate of crushed stone, furnace slag or gravel and sand, in proportions approximating one cement to four of sand or other aggregate, with sufficient water to give plasticity for pouring. These are thoroughly mixed together in quantities convenient of handling.

The machine consists of a series of moulds for receiving the wet material, which is immediately subjected to a specially provided treatment with steam. Steaming is continued for a period of four to five minutes. Plungers are located at the bottom of each mould, connected with mechanism for ejecting the green tile, which are then removed, and the machine is instantly ready for another casting.

Steam curing of the product for 24 hours in summer and is in winter, after which they can be subjected to any climatic condition, is recommended. They may be cured in any kind of enclosure where steam is allowed to escape to immerse the tiles with hot moisture. A much slower method of curing is to thoroughly drench the green tile with water several times during the first day after they are made, and allow them to cure in the air for 30 days (always protected from the direct rays of the sun).

Moulds can be made, it is claimed, in any desired dimensions and in every shape known to good structural usage. The machine is equally adapted to making concrete conduits, sections and sewer pipe with or without bell ends; also fittings and shapes of all kinds.

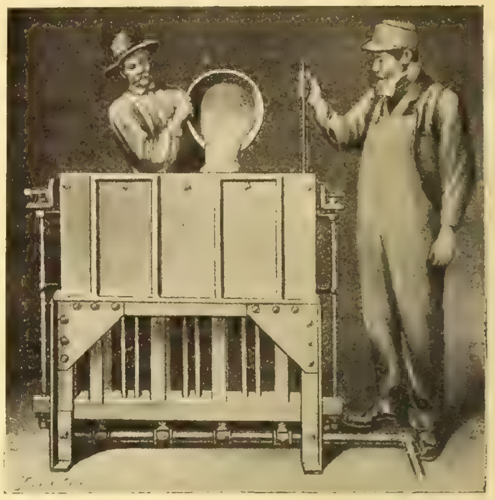
Tiles have been made using aggregate of crushed limestone, crushed trap rock, granulated slag, graded gravel and coarse sand. These have been thoroughly tested, and in compression have been demonstrated to be fully up to the same test of the clay tiles now in use, while the tiles made from trap rock and slag aggregates far exceeded the tests, it is claimed, of any other known material designed for like purposes. The breakage in manufacturing 10,000 tile amounts to less than one per cent.

The inventor, Mr. A. A. Pauly, has been making practical use of his invention for the last two years in Youngstown, Ohio, where he has a large plant in operation. During this period some 200 houses in Youngstown have been built out of Mr. Pauly's tile, so that the tile in no sense is experimental. The process has been developed by practical men and the product has been thoroughly tried at Youngstown, Ohio. The results have been uniformly successful and the various claims set forth above are the results of practical experience.

Finished concrete house, illustrating the possibilities of Pauly Hollow Tile

The Canadian rights for the Pauly machine have been purchased outright by Mr. Kennedy Stinson, of the Stinson-Reeb Builders' Supply Company, Limited, Eastern Townships Bank Building, Montreal, Que. We understand that Mr. Stinson is now making arrangements for leasing these machines out on a royalty basis, giving exclusive rights for manufacturing concrete product from these machines within a limited territory.

Arrangements are practically completed for the territories of Winnipeg and Edmonton, where factories will be erected for the manufacture of the Pauly tile. In the course of a month or so, the tile will be placed on the Montreal marke

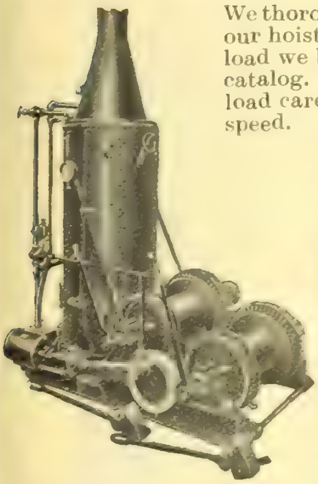


Method of casting Pauly Hollow Tile. Pouring liquid concrete into moulds.

The company at Montreal will be known as the Concret Structural Tile Company. Further information and illustra ed, descriptive literature may be obtained from Mr. Kenn Stinson, Stinson-Reeb Builders' Supply Company, Limit Montreal.

Col. H. N. Ruttan, city engineer of Winnipeg, was cently presented by his staff with a handsome oil portrait himself to mark the completion of a quarter of a century office. A congratulatory address was made by Mr. R. Willson, assistant city engineer. A handsome bouquet roses was presented to Mrs. Ruttan.

The Guaranteed Hoisting Engine



We thoroughly guarantee each one of our hoisting engines to lift the full load we build it for, as shown in our catalog. We guarantee it will lift its load carefully and at the catalogued speed.

We guarantee it to be built strong enough for all normal working conditions incidental to contractors, work. We guarantee it to be quick and sure in operation.

Did you ever stop to figure out what you lose by using a Hoist that is not guaranteed fully by its maker? How many vexatious delays do you have due to the machine not working right or perhaps refusing to work at all? What is your loss in wages when your Hoist is balky? What about the loss in material—and perhaps life—when the hoist fails under a heavy load?

Marsh & Henthorn, Limited

Makers of Hoisting Machinery **Belleville, Ont.**

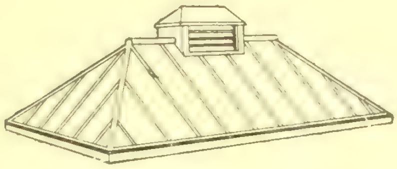
Sales Agents: MUSSENS LIMITED, Montreal

"A work ill done must be twice done—only the best gives satisfaction."

—The Philosopher of Metal Town.

Metallic Skylights

Are Practically Imperishable



The framework is of hollow metal, galvanized steel or sheet copper and when glazed with **wire glass** is **absolutely fireproof.** We make all shapes and sizes.

The exclusive features of "Metallic" Skylights make for permanency and absolute satisfaction. See that they are specified in contracts.

Information and prices on request.

Manufacturers 1953

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

AUTOFORCE VENTILATING SYSTEM

PURE AIR

Positively No Down Draft

(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is [illegible] perfect ventilation and preventing [illegible] used to produce a draft, are [illegible]

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This is the busy season for architects and contractors, preparing plans and specifications for Spring operations, be sure you recommend

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It's the make that lasts the longest, looks the best

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Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

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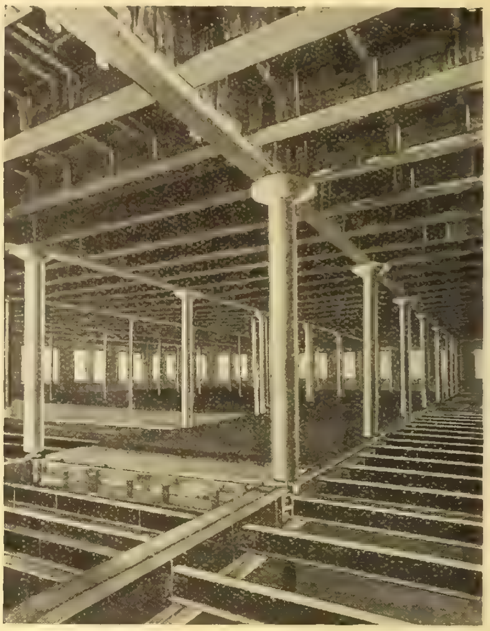

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Used in all modern buildings where the maximum amount of light and sanitary conditions are essential

Summary of Classified List of Jobs

No.	JOBS	1st. Quality	2nd Quality
104	Public Office Bldgs. Banks, Libraries, Halls and Theatres	3,540,991	412,545
50	Private Residences	1,023,050	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables,	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and FireHouses	208,664	28,837
656	Total 1st	12,800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
717		17,562,741	

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because of its perfect manufacture, you save time money. This Brand is the standard by which all others are judged. Then why experiment with other Brands when you can have the best? Send us a trial order and you will wonder why you did not use **"Empire Brand"** long ago.

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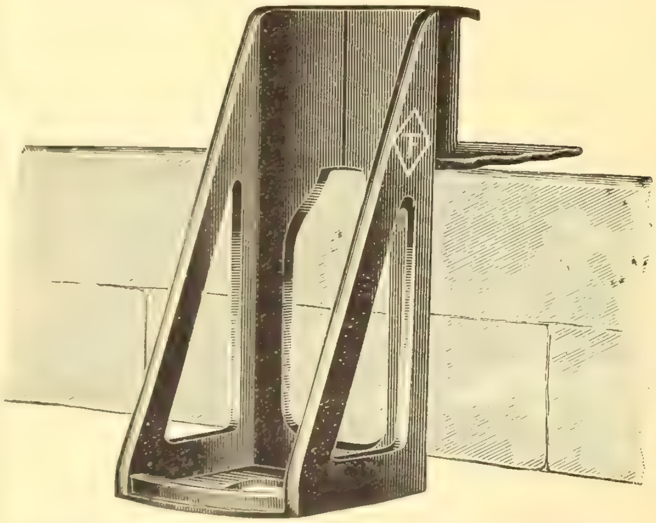

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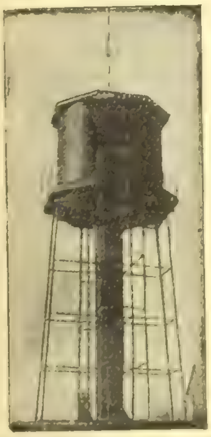

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Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? **This is how!**

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

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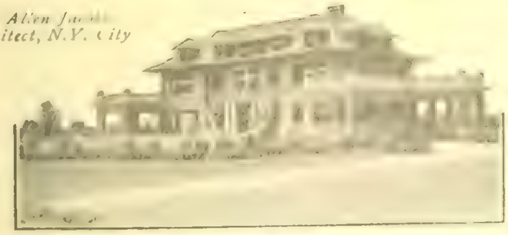

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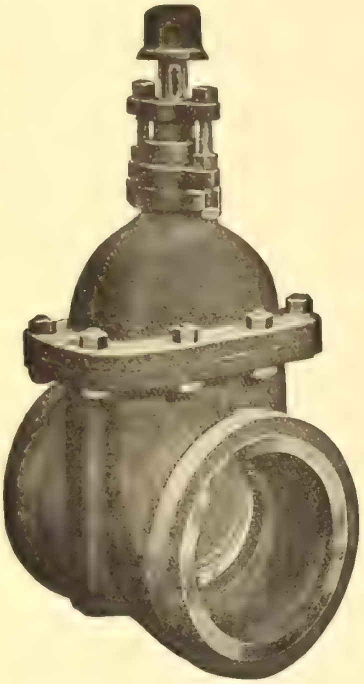

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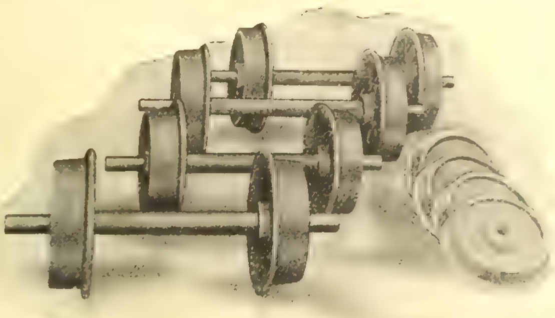

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Write our nearest plant for further information as to prices, deliveries. etc.

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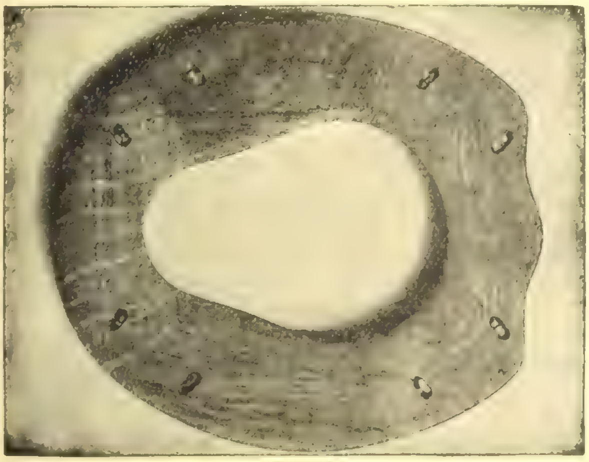
meet the demand for a closet seat that should always maintain its solidity, that should never under any circumstances come apart or split at the joints and that should possess sanitary perfection.



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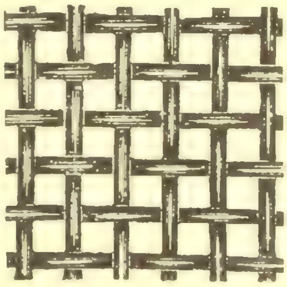

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There is no kind of Wire Fabric required in the production of any machine or manufactured article that we cannot furnish.

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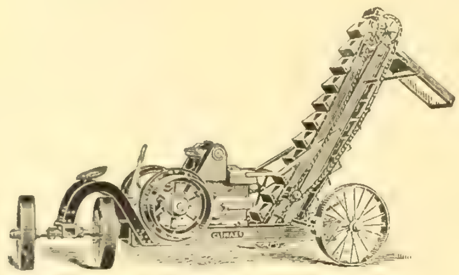

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We are furnishing the Interior Trim for a large percentage of the best Residences, Banks, Churches and other Public Buildings in the country. We also contract for all Carpentry Work. We maintain a high standard of workmanship and material. By specifying our high-grade Fittings, Architects and Contractors are sure of completing the work with satisfaction to themselves and the owner. A million feet of Thoroughly Seasoned Hardwoods always in stock.

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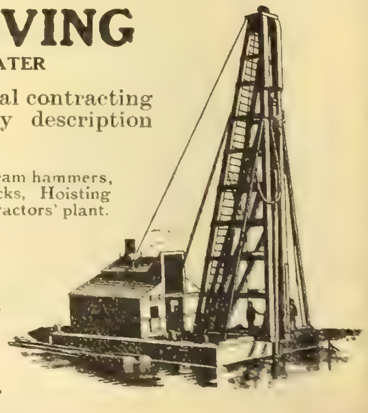

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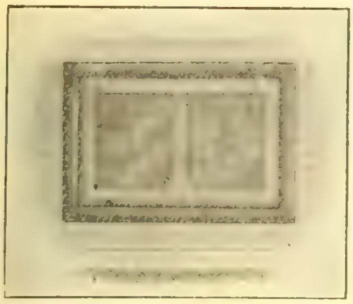

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Our flooring is thoroughly **air-seasoned** and **kiln-dried, end matched,** and **bundled.**

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Tongue and groove. Hollow backed.
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are invited to get our quotations on Wire Reinforcing. We are operating the largest and oldest wire goods plant in Canada. Our

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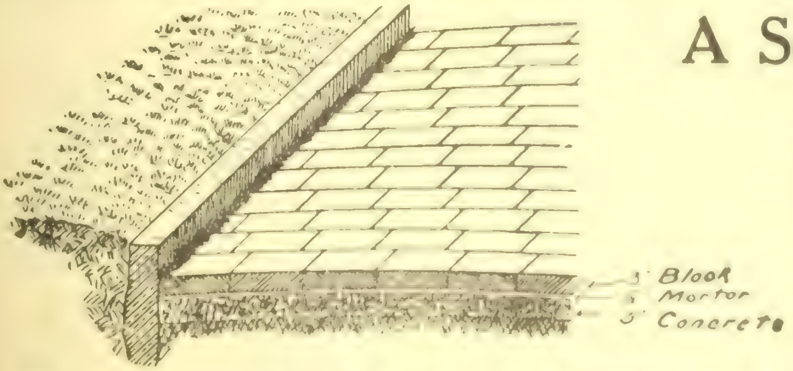

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Durable and Non-Abrasive.
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Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, or foundation work	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D,D.
10 to 25 united inches	$4.25	$ 6,25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i,	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	.,..	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex. and 3-16-inch round, 35 cents per square foot up.
Floor Tile—½-inch square 45 cents.
Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 25 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish colors, firsts 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G, Cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Brass Goods, Valves, etc.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Furnaces 45 per cent.; registers 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.; other specials, 40 per cent.

Boilers—Galvanized Iron Range,

30-gallon, standard, $4.75; extra heavy, $7.00.

CastIron Sinks.

16 x 24, $1.00; 18 x 30. $1.15; 18 x 36, $1.95.

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The Ontario Gazette contains notice of the granting of a license to Siemens Brothers' Dynamo Works, Limited, of Great Britain and Ireland, to carry on the business of [illegible] in Ontario.

[illegible] Company, Montreal, [illegible] capital $20,000, incorporated to manufacture and supply electricity in the counties of Bagot, etc. Incorporators, David King, insurance agent, Montreal, Que., H. C. Moore, barrister, Chatham, Ont., and others.

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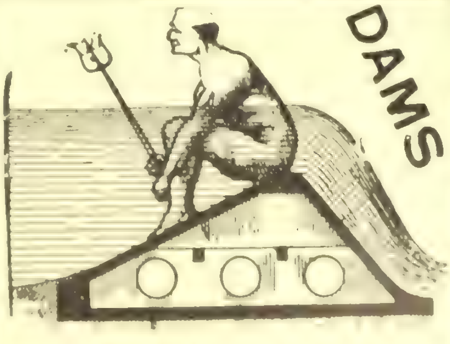

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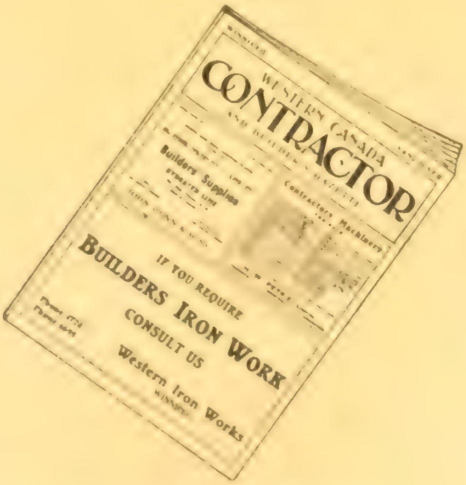

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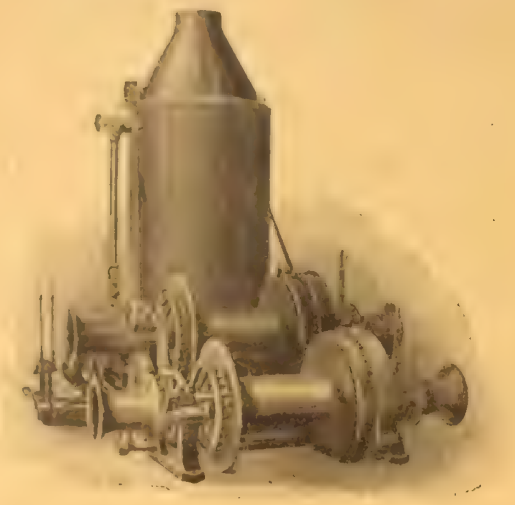

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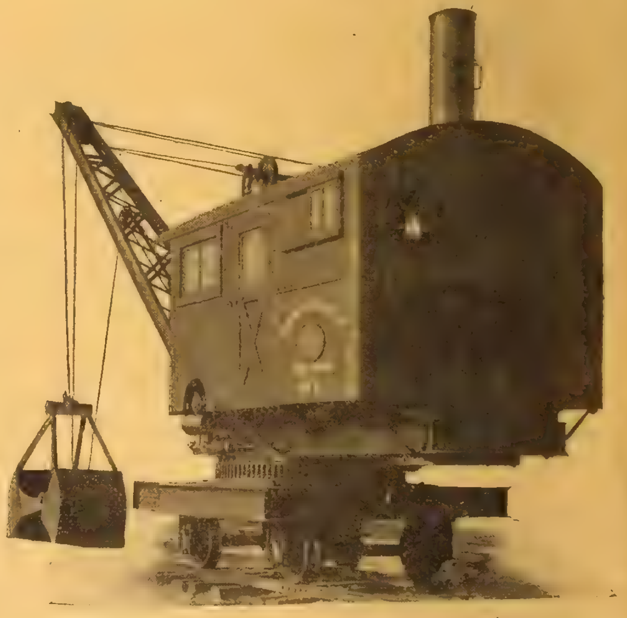

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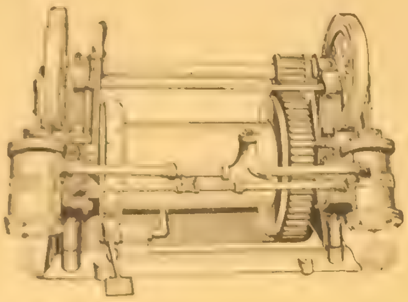

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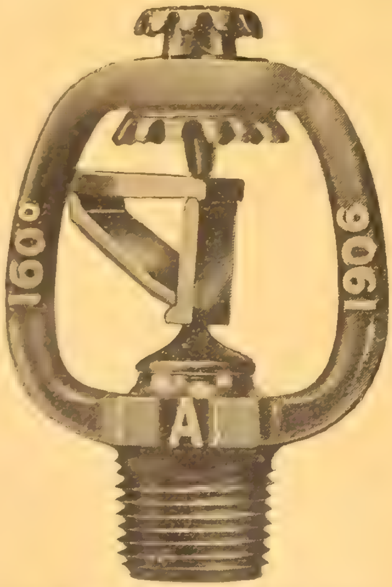

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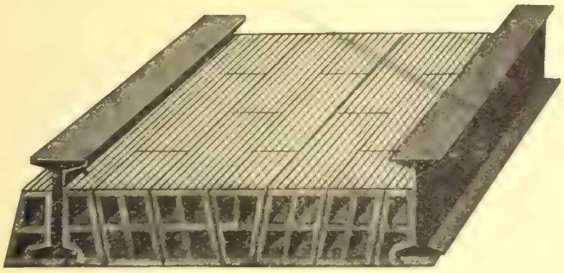

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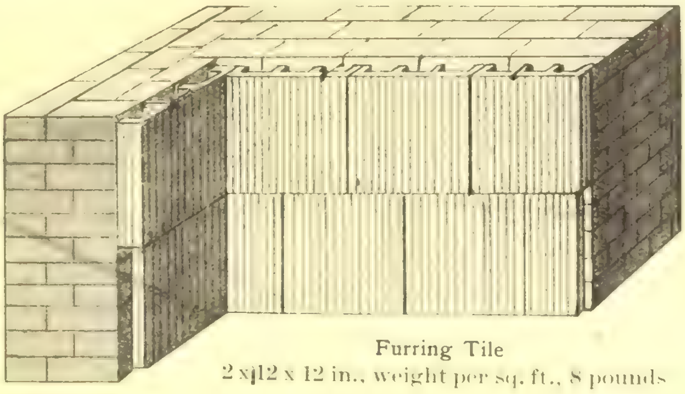

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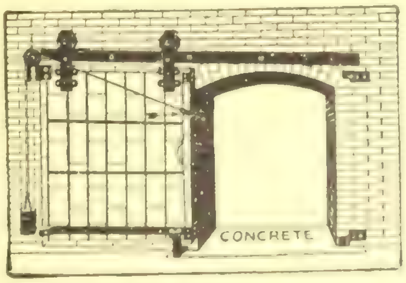

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Ontario Wind Engine & Pump Co.	5

Typewriters	
United Typewriter Co.	6

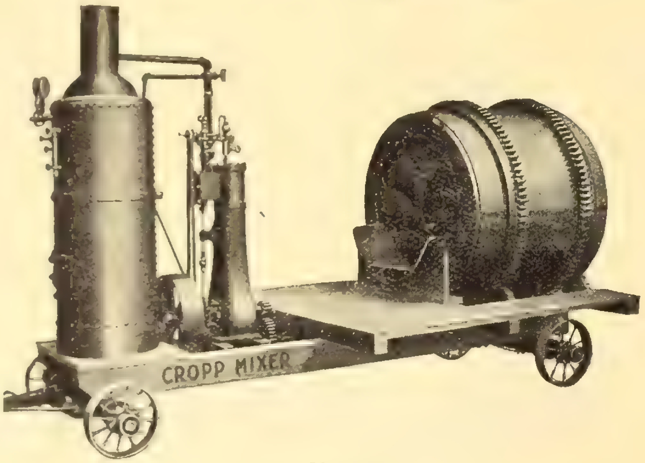
Valves	
Canada Iron Corporation	6
Gartshore-Thomson Pipe Co.	6
Kerr Engine Co.	6
Standard Fitting & Valve Co	6

Ventilating System	
Gardiner & Gaskill	5

Wire Rope	
Dominion Wire Rope Co.	6
Greening Wire Co., B.	6

Wire Fences and Screens	
Beath & Son, W. D.	5
Canada Wire Goods Mfg. Co.	6

Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

We are bringing out a small Mixer number "O" which holds a One, Two and Four mix. This Mixer is very light and portable—just the thing for small Contractors.

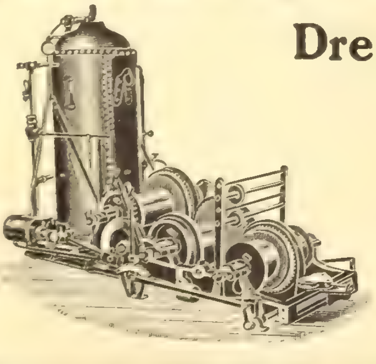
Our Prices Will Interest You

The only Mixer that will not spill when overcharged

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

M. Beatty & Sons, Limited

Welland, Ontario, Canada



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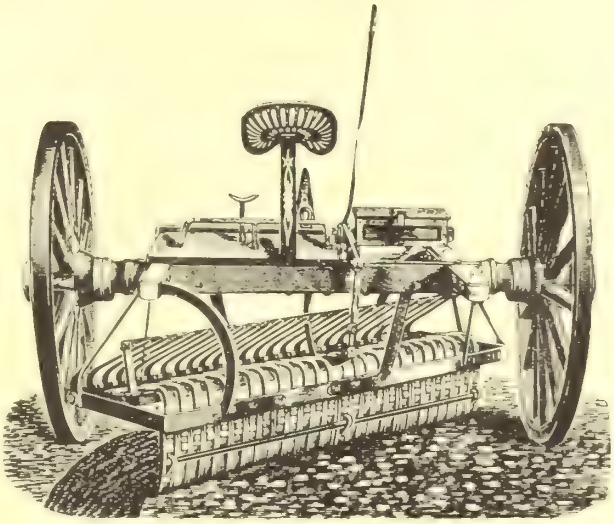

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American Road Machine Co. of Canada, Limited
GODERICH, ONTARIO

Brantford "Automatic" Batch Concrete Mixer

WATER
IDEAL AUTOMATIC BATCH MIXER
GOULD SHAPLEY & MUIR CO. LIMITED BRANTFORD CANADA

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues

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"I cannot doubt but that the manner in which the defendant has offered its goods to the public, advertised them —the similarity of the labels; similarity of combination in catalogue, the use of the word 'STANDARD,' were fitted to deceive the public, and are proved, in some instances to have deceived the public. Nor can I doubt that such deception was the object kept in view by the defendants' manager." — Extract from Hon. Mr. Justice Archibald's judgment in recent suit of the Standard Sanitary Mfg. Co., Pittsburg, Pa., against the Standard Ideal Co., Port Hope, Ont.

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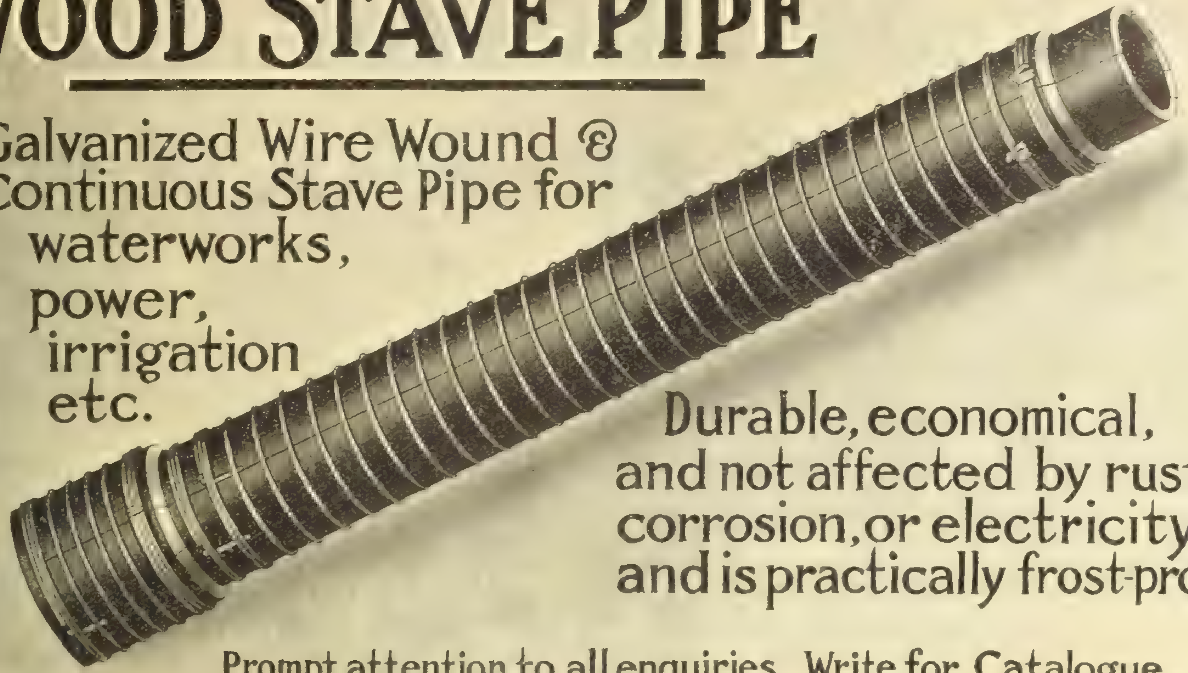

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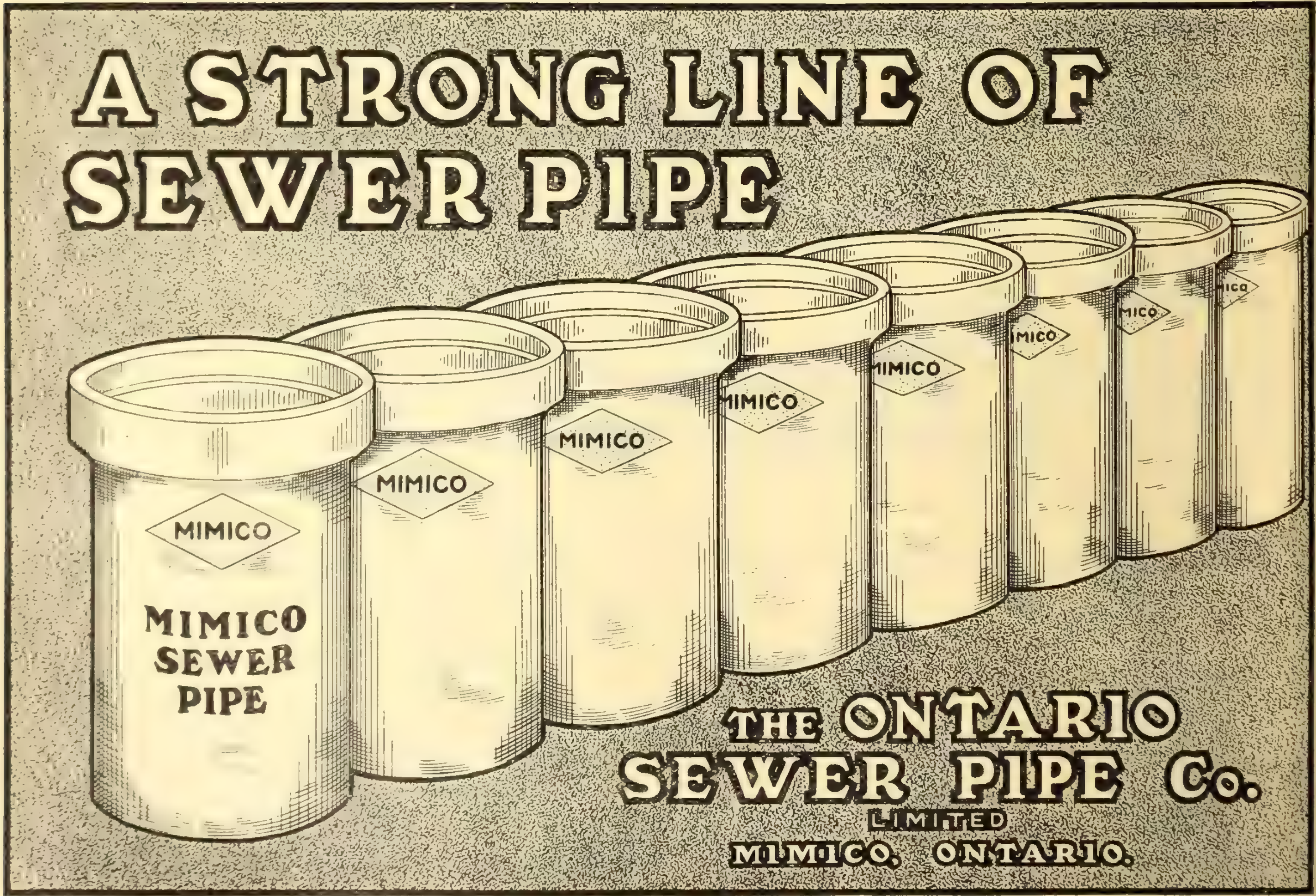
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THE ONTARIO SEWER PIPE Co.
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Firstclass Workmanship and Materials

Prompt Delivery Right Prices

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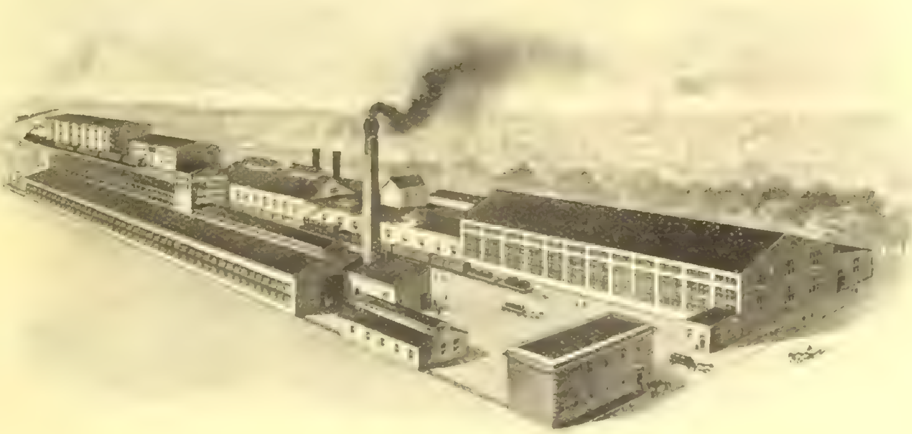

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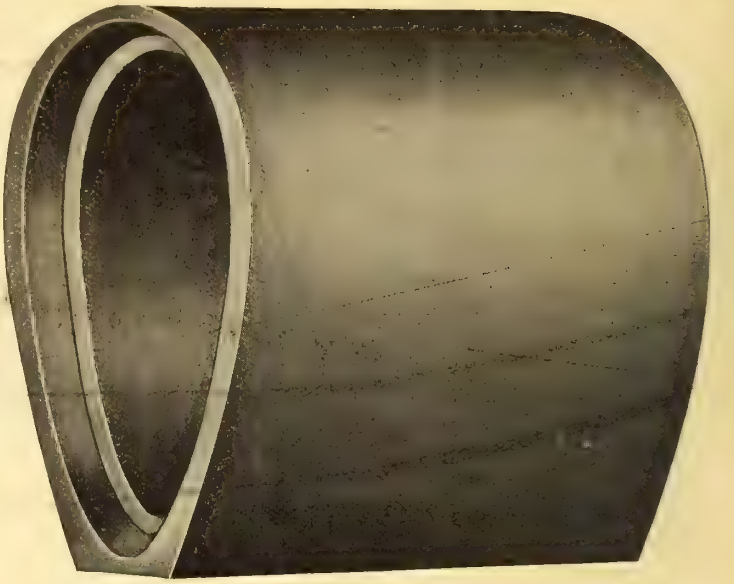
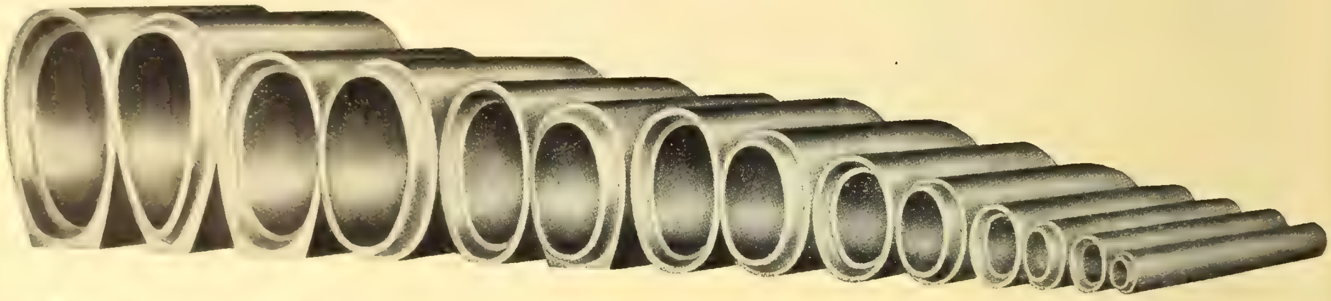
Municipal Engineers and Contractors

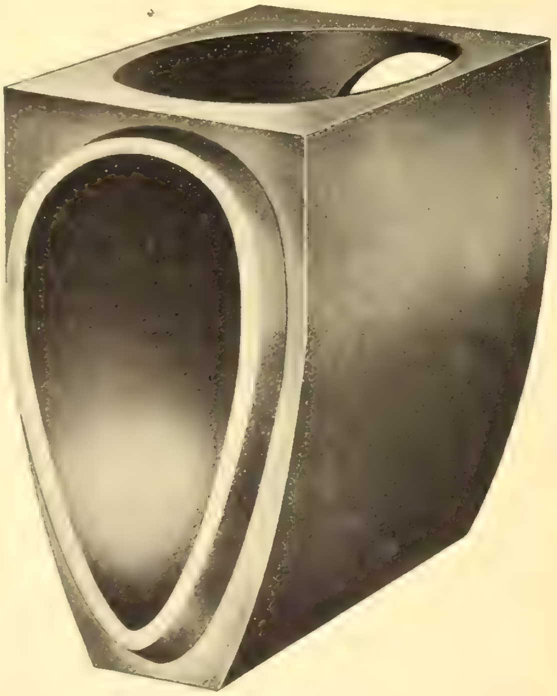
For sewers the only everlasting pipe is **concrete.** Builders do not use brick in foundations. Why? Because of the moisture. They do use concrete. Why? Because it is a proof against the destructive tendency of moisture. Why continue to use brick for sewers when a better material is now available at as low a cost?

In Duluth brick sewers failed after seven years so as to require replacement. Concrete sewers put in at the same time are intact. In Milwaukee after 25 years concrete pipe was found better than when new. Of 300 miles of sewers in Milwaukee over 200 miles are of **concrete.**



Section of 2′ x 3′ pipe.





Man-hole Section of 2′ x 3′ pipe.

Concrete sewers abound in England and Germany. The modern sewers of Paris are all of concrete. American cities have adopted it. Brooklyn has hundreds of miles of it with not a single failure, whereas even Scotch vitrified pipe has been found to have deplorably failed there. Toronto, after much hesitation, is now in line with concrete. Why be the last to join the ranks you eventually will and must join?

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The demand for our material, not only in Canada, but in the United States as well, has grown so much faster than our most sanguine expectations permitted us to hope, that we are again obliged to make very large additions to our plant.

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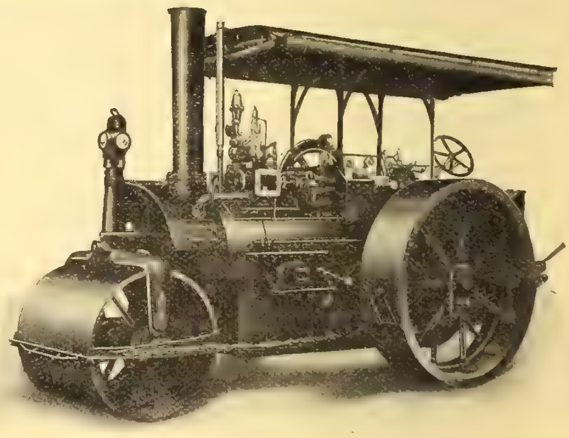
The Roller that is Responsible for Good Roads

has become the standard of Road Roller construction for the following reasons: Compact and simple, its moving parts are fewer and stronger and its bearings more ample than any other Roller. It is a **double cylinder machine** with cranks set on the quarter, obtaining a uniform thrust and distribution of load and full power transmission at all times. With no dead centers, the Roller can be started from any position on the level or on grade. Steam dome, cylinders, guides and steam chests cast in one piece, avoiding all piping, joints and leaks. Boiler, of the locomotive type of highest fuel economy, and with perfect steaming qualities, quickly fired and easily cleaned. The Roller has **two positive gear speeds**—one fast speed for puddling and finishing and for rapid moving on finished roads. The other slow, for powerful compression and for handling steep grades without increase of steam pressure. Steel yoke, steel boiler and steel shafting make it practically a Steel Roller. Operated entirely from the engineers' platform. All working parts arranged for easy oiling or adjusting, recommending it to the engineer and insuring its long life to the purchaser.



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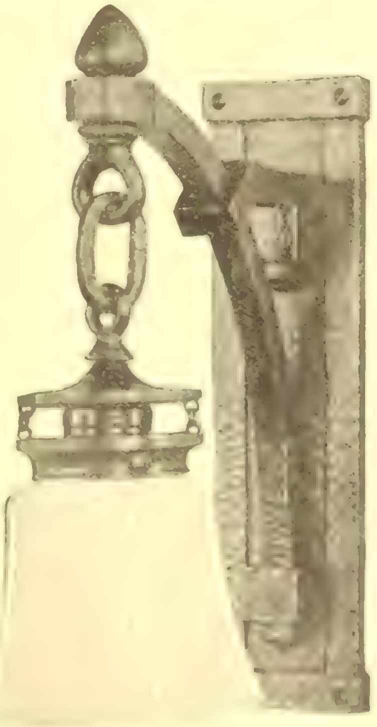

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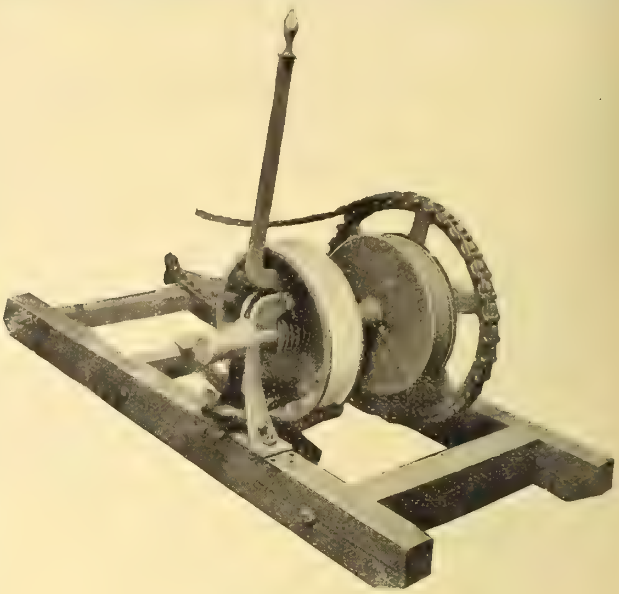
If you are investing in a hoist you can't do better than the



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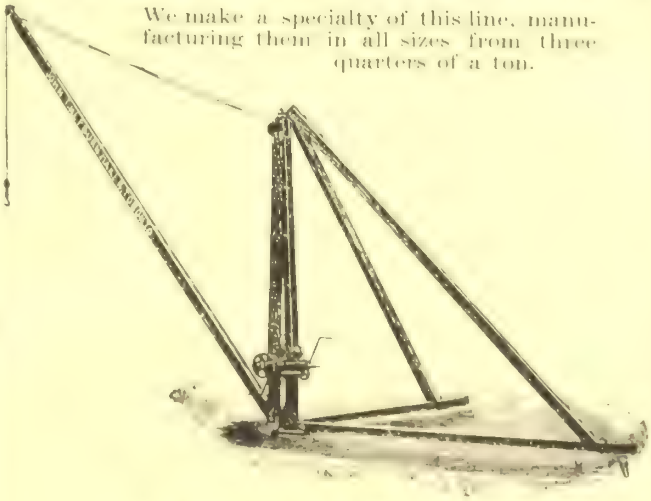

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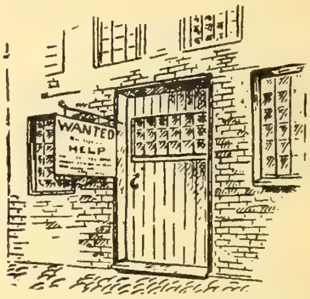

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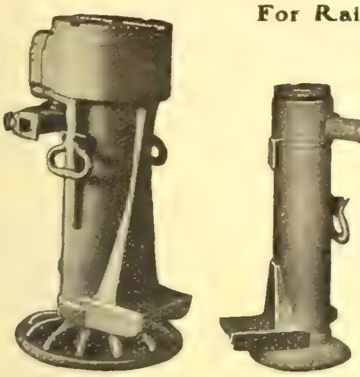

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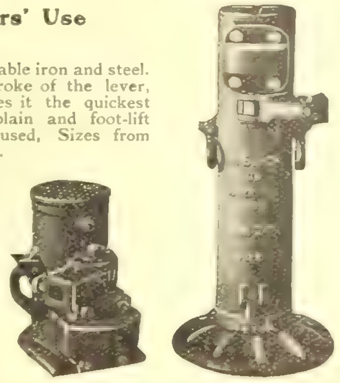

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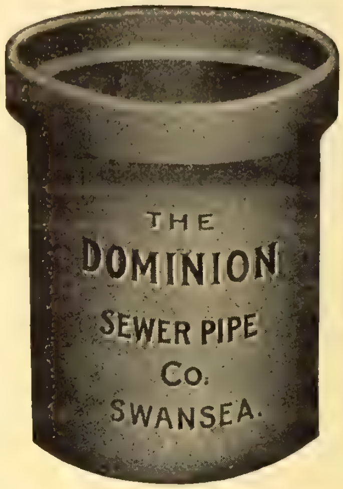

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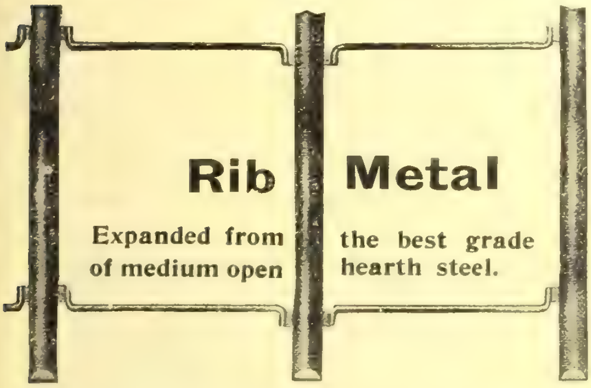
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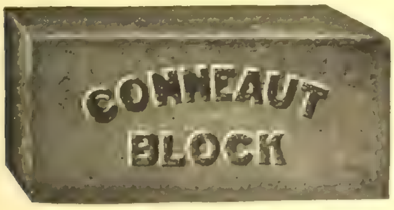

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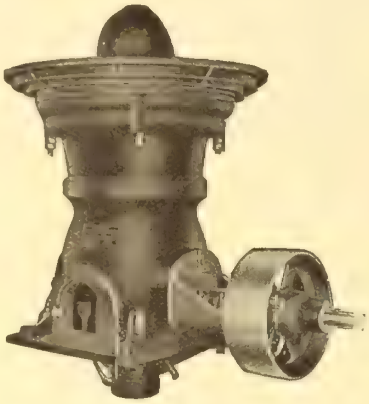

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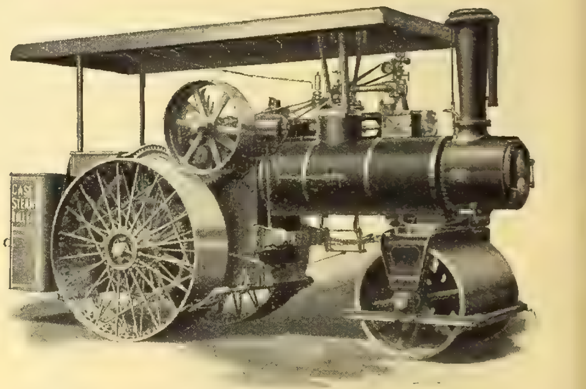

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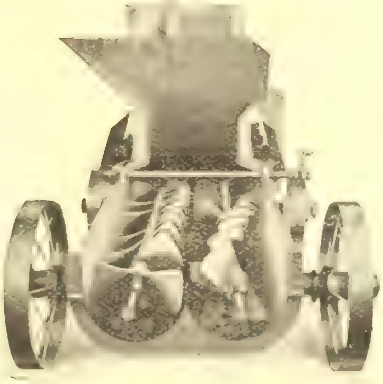

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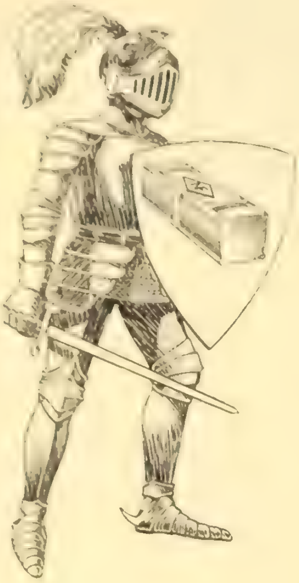

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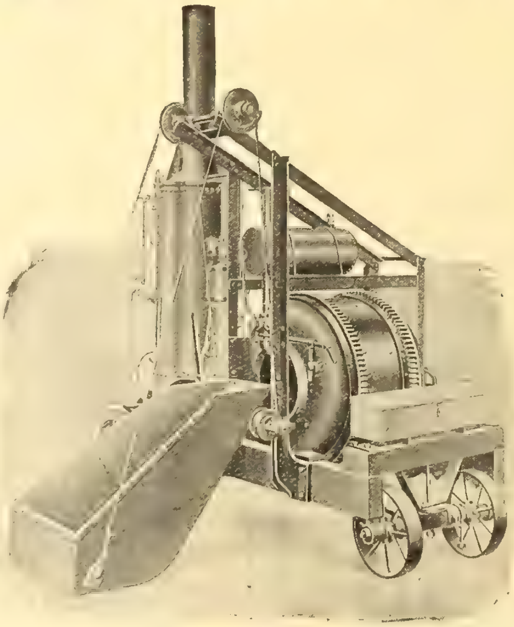

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Aylmer, Ont.

The Water Commissioners have purchased land for a reservoir and work will be commenced at once on a pipe line. It is estimated that this will give the town from three to five hundred thousand gallons more water a day, at an initial cost of $12,000.

Brantford, Ont.

Tenders addressed to James A. Smith, Township Clerk, Brantford, Ont., will be ceived until April 16th, 1910, for the construction of the Parkdale drain. Plans and specifications may be seen at the office of W. H. Fairchild, C.E.

Chilliwack, B.C.

Lionel H. Buck, C.E., of Vancouver, will be engaged by the council to submit a specified scheme for a drainage and sewerage proposition.

Fort William, Ont.

Contractors may be given a chance to bid in the sewer construction contemplated by this municipality.

Hamilton, Ont.

Tenders addressed to John McLaren, chairman, Board of Control, will be received until April 19th for constructing sewers on the following streets: Barton street, Trolley street, Main street, Melrose avenue, King street and Lottridge street. Plans, etc., at office of the city engineer; S. H. Kent, city clerk.

The by-law to issue debentures to the amount of $100,000 for extending and improving waterworks has been passed by the council.

Nanaimo, B.C.

Tenders are being invited until the 23rd inst. by this municipality for the supply of Portland cement, f.o.b. Nanaimo; copies of specification or requirements with Mr. Allan Waters, City Engineer.

A by-law to authorize the borrowing of $20,000 for the construction of a concrete dam at No. 1 reservoir will be submitted to the ratepayers on April 15.

Oshawa, Ont.

This municipality will construct pavements to the amount of $15,307.30 this season.

Outremont, Que.

The Town Council are considering a proposal to borrow $250,000 for municipal public works, to be divided as follows:—Sewers and waterworks, $136,500; street grading and macadamizing, $68,500; sidewalks, $25,000; town hall and fire station, $20,000.

Pelee Island, Ont.

Tenders will be received for $25,271 5 per cent. 20 instalment drainage improvement debentures. William Stewart, Township Clerk, Pelee Island, Ont.

Port Arthur, Ont.

Tenders are being called by J. McTeigue, city clerk, until April [illegible] for pavement construction. For further information see advertisement in this issue.

Peterborough, Ont.

Ald. Hicks chairman, Board of Works, has been authorized to have an estimate made of the cost of the proposed sewer pumping station, the relaying of Romains street sewer, the required surface drainage and also of the septic tank. Consulting engineer, Willis Chipman, C.E., Toronto.

St. John, N.B.

The board of works have recommended that tenders be called for paving under the specifications prepared by the engineer.

Toronto, Ont.

The waterworks by-law to authorize the issue of debentures to the amount of $279,000 was carried.

Tenders will be received until April 19th for supply of cast iron pipe for the past year, ending April 30th. For further information see advertisement in this issue.

Tenders addressed to G. R. Geary, chairman, Board of Control, will be received until April 19th for asphalt pavements on ten streets; bitulithic pavements on four; vitrified block pavement and grading on one; and concrete curbing on four; also sewers on three. Specifications at office of the City Engineer.

Verdun, Que.

The Town Council have adopted Engineer's estimates, which recommends an expenditure of 25,000 for the construction of roads, sidewalks and waterworks.

Vernon, B .C.

This municipality has decided to lay cement sidewalks immediately, and tenders have been invited for the new water mains.

Victoria B.C.

Tenders will shortly be called for the paving of Linden avenue a section nearly a mile in length; also for five miles more or less on other streets. The city will send in a bid. G. H. Bryson, assistant city engineer.

Woodstock, Ont.

Tenders are being called by this municipality until April 23rd for the construction of concrete sidewalks during season of 1910. F. J. Ure, city engineer. For further information see advertisement in this issue.

Winnipeg, Man.

[illegible] from Erin street to Wall street, to be in on or before the 20th inst.

The engineer reports that the estimated [illegible] Cambridge street to the city limits, was [illegible] Crescent road, from Ash to Renfrew, will cost $49,772. The cost of the sewer in Renfrew, from Crescent road to Godfrey, is [illegible] sub-main in Godfry at a cost of $68,737. The main sewer on Ash street under this plan would cost $44,495. The engineer recommended the latter plan which does not include a sewer in Wellington crescent, at present. The board recommended a full width asphalt pavement and sidewalks on Pembina, from Stradbrooke to Corydon, at an estimated cost of $32,000. The committee passed the work on the understanding that it would not be done until next year.

AWARDED.

Edmonton, Alta.

The tender for supply of water pipe has been awarded to the Edmonton Concrete Company, $9,[illegible].

London Ont.

At the meeting of the board of works recently the following tenders for supplies were accepted:—Tile 4, 6, 8, 10 and 12 inch, T. Patterson & Company; junctions and 15 and 18 inch tile, Hayman & Mills; 20, 22 and 24 inch tile, W. Heaman & Sons; concrete tile, E. North & Sons. Gravel:—District No. 1, W. J. Boss, $2.24 a cord; No. 2, M. Morkin, $2 a cord; No. 3, M. Morkin, $2.40; No. 4, M. Morkin, $3.20; No. 5, G. Alexander, $3; No. 6, G. Alexander, $2.90; No. 7, W. J. Boss, $2.50; No. 8, W. J. Boss, $2.80. Cement Walks:—North of Dundas street, W. J. Anthistle, 8 cents a foot; south of Dundas street, G. Norton, 8 1-4 cents. Curbs and Gutters:—W. J. Anthistle, 28 cents. Portland cement, Chantler Bros., $2.48 a barrel. Corner irons, Gleeson Bros., $3.90 per cwt. Iron castings, Vulcan Company, 2 1-8 cents a pound. Broken stone, delivered, F. Hutchinson, $1.37. Bridge flooring, white oak, Ferguson Lumber Company, 16 feet, $35.75 per thousand; 20 feet, $38.75 per thousand. Repairs to steam roller, Warren Bros., $875. Lumber, Dyment-Baker Company. [illegible] & Company.

Nanaimo, B.C.

The following list of tenders for supply of sewer pipes has been sent in: The Dominion Glazed Cement Pipe Company, Vancouver, $28,645; the Hickman Cement Construction Company, Vancouver, $30,660; the British Columbia Supply Company, Vancouver, $33,301; the British Columbia Pottery Company, Victoria (accepted tender) $33,165; the Ontario Mimico Sewer Pipe Company, Ontario, $33,613; Hamilton & Toronto Sewer Pipe Company, Ontario, $35,373; the Dominion Sewer Pipe Company, Ontario, $35,862; Messrs. [illegible] mo). The two lowest tenders are for cement pipes.

New Toronto, Ont.

[illegible] the following tenders for sewers: Successful bidder, I. M. Scott, Lambton Mills, [illegible] bell, $10,889; George Orpen, $5,200; Thos. [illegible] 680; I. M. Scott (successful), $4,727; For [illegible] Construction Company, $4,489. J. A. L. Macpherson.

Winnipeg, Man.

The Stanton Iron Works have just been awarded the contract by the Board of Control for supplying water pipe. This company's tender was the lowest at $18,131. W. Beverley Robinson, agent, Montreal.

Railroads, Bridges and Wharves

Brantford, Ont.

Tenders are being called by this municipality until April 22nd for a reinforced concrete bridge across the canal on Market street. T. Harry Jones, city engineer. Plans and specifications at offices of the "Contract Record," Toronto, and B. 34 Board of Trade Building, Montreal. For further particulars see advertisement in this issue.

County of Hastings, Ont.

One June 22 the county council will consider a by-law to issue $20,000 20 years bridge debentures. A. M. Chapman, County Clerk.

Edmonton, Alta.

Work is to commence at once on the completion of the Tofield-Calgary branch of the G. T. P. by Geo. Webster, of Winnipeg, who has the contract for the balance of the 140 miles of the branch. Webster's headquarters will be at Alix. The line will be finished to Calgary this year.

Fredericton, N.B.

Tenders are being called for Clifton high and low water wharf until April 25th by the Department of Public Works. Plans, etc. at the aforesaid department, and at the office of G. B. Jones, Apochaqui, and at residence of Richard Wetmore, Clifton, N.B.

Fort William, Ont.

The C. P. R. will double the capacity of its hard coal storage warehouse at a cost of $200,000.

London, Ont.

At a conference between London and Westminster townships, it was decided to rebuild the Meadow Lily bridge. The new structure will be of steel and concrete. The township of London will erect two new bridges over Bear Creek, one at Coldstream and the other at Poplar Hill. Both will be of steel and concrete. Geo. Riddell, Odell, clerk of Westminster; Miss M. Grant, London, of London.

Orillia, Ont.

The extension of the C. P. R. line from Coldwater here has been authorized.

Oakville, Ont.

The county council have decided to call for tenders for both steel and cement in connection with the bridge necessary to replace old bridge on Middle road near here. Estimated expenditure, $17,000. Barber & Hutcheon, engineers, have been consulted.

Red Deer, Alta.

The Canadian Pacific Railway Company (J. G. Sullivan, asistant chief engineer, Montreal, Que.), is reported to have acquired the interests of the Alberta Central Railway Company and will this spring commence work on the line, which will run eastward from the Pacific Coast to Red Deer and then to Saskatoon.

Sault Ste. Marie, Ont.

Time limit has been extended to April 30th for tenders desired for the clearing, grading and bridge work on the 31 mile section of the Algoma Central & Hudson Bay Railway between Hawk Lake Junction and Hobon. C. N. Coburn, chief engineer, Algoma Central & Hudson Bay Railway.

Trenton, Ont.

The Canadian Northern Railway Company J. M. Campbell, resident engineer, at Belleville), is reported to be making surveys for the line east from Trenton to Ottawa.

Toronto, Ont.

Tenders are being caled by the Board of Control until April 19th for the construction of piers, abutments and concrete floor slab for a bridge on the extension of Wilton avenue crossing over the River Don. Advertisement in this issue.

Vancouver, B.C.

It is announced that the first section of the Port Moody, Indian River & Northern Railway, a charter for the construction of which was secured at the last session of the legislature, will be under construction within a few weeks.

Winnipeg, Man.

Tenders addressed to N. E. Brooks division engineer, will be received until April 18th for the excavating and backfilling of trenches for 6 inch pipe lines at the following points on Western Division, C. P. R.: Chaplain and Forres, 1 mile each; Macoun and Grassy Lake, each aproximately 6 miles; Walsh, approximately 13 miles. Plans, etc., at assistant chief engineer's office, Winnipeg; division engineer's office, Calgary, and resident engineer's offices at Moose Jaw and Medicine Hat.

AWARDED.

Guelph, Ont.

The Township of Guelph have awarded a contract to Walter Davies of Stratford, Ont., for the construction of a concrete arch bridge consisting of three spans of 33 feet each over the River Speed. The bids were as follows: Walter Davies, $2,073; H. Croft, Guelph, $2,200; J. D. Callaghan, Arthur, $2,475; Fraser & Clemens, New Hamburg, $2,677.70; Rutherford & Patten, St. Catharines, $2,775.

Public Buildings, Churches, Schools, etc.

Barrie, Ont.

Tenders will be received until April 18th for work and material required in the erection of a new wing for the Royal Victoria Hospital. F. S. Baker, architect, Traders Bank Building, Toronto. For further information see advertisement in this issue.

Beaverton, Ont.

At a meeting of the ratepayers, it was decided to purchase a site for a new school in the Sunderland section to cost about $8,000. It is probable that the work will commence at once.

Tenders are being called until April 25th by J. McArthur, Township Clerk, for the erection of the new Town Hall and market here. For further information see advertisement in this issue.

Brandon, Man.

The city council are considering the erection of a new central fire hall and also extensive improvements to the city hall. Ald. McKenzie, chairman, Fire and Light Committee; Engineer Speakman has been authorized to secure cost of the latter, in which Architect Sinclair will assist him.

Calgary, Alta.

The Board of Health have recommended that the City Council call for estimates of the cost for a new city isolation hospital.

W. J. Tregillus has offered the exhibition company a free site of 150 acres just west of the city limits, worth about $100,000.

Courtland, Ont.

D. W. White, clerk of Middleton, writes that no tenders were received for the reconstruction of the municipal hall.

Edmonton, Alta.

A by-law to authorize the expenditure of $25,000 for purchase of library site will be submitted to the ratepayers shortly.

Estevan, Sask.

Tenders will be received by B. Glover, secretary, public school board, until April 20th for the installation of a heating and plumbing system in the 8-roomed school. Plans, etc., at Builders' Exchange, Winnipeg.

Fergus, Ont.

Tenders for St. Andrew's Church sheds will be received until April 15th. Plans and specifications can be seen on applying to the undersigned, J. H. Dick, Secretary, Board of Managers.

Tenders addressed to P. Perry, secretary-treasurer, Fergus Library Board, will be received until April 14th for the several trades in connection with the erection of a Carnegie free library here. Plans, etc., at office of W. A. Mahoney, architect, Guelph.

Galt, Ont.

The Scott Opera House was damaged by fire to the extent of about $20,000.

Hamilton, Ont.

Tenders addressed to W. R. Robb, president of I. O. O. F., will be received until April 21st for the various works required in the erection of a temple for the above order. Plans, etc., at office of the architects, Stewart & Witton. Tenders for each line of work to be separate. A. Fraser, secretary-treasurer, I. O. O. F. Temple.

Hull, Que.

The excavation has begun on Alma street for the erection of a building for the Oblate Fathers and will cost about $5,000 or $6,000. The contract was recently given to Messrs. Pepin & Caron.

Lethbridge Alta.

The school board has decided to build an eight-room school at once in the southern part of the city.

Until April 15th tenders will be received for $30,000 30-years 5 per cent. Protestant public school debentures. C. B. Bowman, secretary-treasurer.

Montreal, Que.

Plans and specifications for alterations to the Lachine Market are being prepared by Dalbe Viau, architect, 76 St. Gabriel street, for the city of Lachine.

Finlay & Spence, architects, Guardian Building, have prepared plans for the erection of an additional building for the Orpheum Theatre interests on St. Catherine street.

Tenders close April 16th at the office of J. Rawson Gardiner, architect, Quebec Bank Building, for the construction of the Tabernacle Baptiste Church to be erected on Delorimiere avenue.

At a meeting of the Board of Governors of McGill University, it is stated, plans were approved for the west wing of the new medical building and authorization was given for the calling for tenders for the construction work.

In the course of a week it is expected that plans will be completed and tenders received for the construction of a new school building on Stadacona street, for the Hochelaga School Commissioners. Dalbe Viau, architect, 76 St. Gabriel street. (Previously mentioned.)

Moose Jaw, Sask.

W. F. Heal, city clerk, has been authorized to call for plans for a hospital to cost not more than $9,000, to be in by the 11th inst.

Nanaimo, B.C.

The estimates of the city council for the current year provide for an expenditure of $75,578.67, including $24,252 for schools.

New Liskeard, Ont.

The congregation of Church of St. John are considering the advisability of the erection of a new church. Messrs. Morgan Summers and Hutchinson, members of Finance Committee.

Niagara Falls, Ont.

At a meeting of Italian Catholics held here recently it was decided to begin the building of a $12,000 church on Seventh street within a month. It is the intention to have the church completed during the coming summer.

Orangeville, Ont.

The Town Council has been asked to vote $5,000 to defray the expenses of building a new wing and making allterations to the High School.

Ottawa, Ont.

The Carleton council could not see its way clear for the present to assume the responsibility for tuberculosis hospital, and so the proposal was turned down. Noted in issue of March 23rd.

Tenders addressed to J. D. McLean, Secretary, Department of Indian Affairs, Ottawa, will be received until April 23rd for the erection of a brick schoolhouse on stone foundation, for the Oneida Indian Reserve, Ont. Plans, etc., at postoffices in St. Thomas, London and Woodstock, and at the office of the Indian Agent, Delaware.

Prince Albert, Sask.

The Northern Produce Company, it is stated, have purchased ten acres on Miller's Hill as a site for the $50,000 abattoir to be erected.

Plans for the new Roman Catholic hospital have been prepared by architect Oluf Albrechasen. Estimated expenditure, $75,000; tenders are being called for first wing.

Princeton, B.C.

At a meeting of the ratepayers on the 2nd inst. a board of management was elected to investigate as to the erection of a hospital.

Quebec, Que.

Tenders addressed to Alph. Gagnon, Secretary, Department of Public Works and Labor, Quebec, will be received until April 20th for the construction of an annex to the present building of the Laval Normal School, on St. Foy Road. Plans, etc., at the office of the architect, Parliament Buildings.

Regina, Sask.

Tenders will be received for $15,000 [illegible] per cent 20 instalment school debentures. J. A. McLachlan, [illegible] treasurer.

Revelstoke, B.C.

The municipality has decided to take a plebiscite as to where the new school shall be located.

Sandwich, Ont.

It is stated that new county buildings will be erected on the present site of the County Treasurer's office in Sandwich, to cost about $20,000. Plans to be submitted to the Provincial Inspector for approval.

Saskatoon, Sask.

The Board of Governors of the University of Saskatchewan have recommended the tender of Smith Bros. & Wilson, of Regina, for the first group of buildings.

The plans of Mr. Webster have been accepted for the new 8-room public school; the board invites plans for a second building on the King Edward school grounds.

Sydney, N.S.

Tenders addressed to James J. Curry, secretary, will be received until April 20th for the erection of the proposed Academy building. Plans, etc., at office of the above mentioned or at the office of the architects, Butler & McDonald.

Toronto, Ont.

The by-law to raise $250000 for the new General Hospital was carried.

The City Architect has issued a permit to The City Architect has issued a permit to the Dovercourt Presbyterian Church for a new Sunday school, $20,000.

It is understood that the Massey estate will make a substantial contribution toward the erection of a new building for the Academy of Medicine, and that a new site in Queen's Park has been placed at the disposal of the trustees.

The Committee on Church Property has recommended that permission be given to Dixie congregation to secure a site and erect a new church.

Vancouver, B.C.

At the meeting of the Exhibition Committee, the executive was given authority to advertise for competitive plans for the grand stand sheds, etc., and also to make further representations to the Marine Department towards the establishment of a fishery building.

Victoria, B.C.

At a meeting of a special committee of the Trades and Labor Council, Messrs. Coldwell, Sherk and Manson were authorized to report as soon as possible as to the best site available for the new building, which will cost from $60,000 to $100,000.

Winnipeg, Man.

At a meeting of the Exposition directors held recently the date for the exposition was fixed for 1914.

The Order of Oblates have decided to build a college similar to the University of Ottawa in St. Charles ,a suburb of the city.

It is reported that the Unitarians are considering the erection of a church here, if not this year, possibly in 1911. Rev. Dr. Vrooman is interested.

A permit has been granted to the Winnipeg School Board for the erection of the Lord Roberts school, on the west side of John, between Beresford and Rathgar, $86,000.

The trustees of St. James will issue debentures for $10,000 to be used towards the erection of the new school, for which the site has been selected on Hampton street north of Portage avenue.

J. R. Jackson, of the firm of Jackson & [illegible] the Y. M. C. A. directors sketches for the proposed new buildings; central building on Vaughan street, six or seven storeys, [illegible]

The [illegible] the money available should not be sufficient, then the structures will be erected later. Major Miller, staff architect, is expected here to advise in the matter.

AWARDED.

Estevan, Sask.

School Board have awarded to Snyder Bros. of Winnipeg, the contract for erecting a school building, exclusive of heating and plumbing, at $22,300. McKenzie & Prevost, of Estevan, bid $22,796.

Hamilton, Ont.

The following tenders for Nurses' Home have been accepted: Masonry, Geo. Mills, $6,990; carpentry, Cruickshanks & Young, $6,490; painting, Goodall & Laidlaw, $1,200; plastering, J. Clapham & Son, $1,774; plumbing, Adam Clark, $1,498; tin work, J. E. Riddell, $484; fire escape, J. Bain & Son, $310; wiring, Electric Supply Company, $150. Total, $18,896. The estimate of the total cost is $25,000. Drake & Drake, carpenters, withdrew their tender because they were several thousand dollars too low in their figuring.

Kenora, Ont.

The contract for the completion of the lock-up has been awarded to M. A. Pigott, of Hamilton. The work was begun last summer by day labor and the foundations are now in.

Laprairie Que.

The general contract for the erection of a presbytery for the parish of Laprairie has been awarded to St. Francois Dufresne contractor St. Laurent, Que. G. A. Monette architect, 97 St. James street.

Montreal, Que.

Gray & Wighton have the contract for building the William Dawson School in St. Denis Ward. A. F. Dunlop, architect.

Ottawa, Ont.

Mr. John O'Toole, of this city, has been awarded the contract for the plastering of the new Sacred Heart Church.

The contract for the Registry Office fittings has been awarded to the Office Specialty Manufacturing Company, $4,495; that for the vault door to J. J. Taylor, $235.

Stratford, Ont.

The contract for the new Registry Office was let to Messrs. Pounder Bros. of Stratford, $10,168.

Toronto, Ont.

The Deisenroth Contracting Company, Yonge street, was awarded the contract for putting in the vault and other office fittings for the electrical department at the city hall, $5,339.

At a meeting of the Hospital Board tenders for the excavations for the main building and administration building facing on College street, and the connecting tunnels, were awarded to Holtby Bros., Robert street, city. The work will be commenced at once. The tender was for a stated price per cubic yard of earth removed, and will amount to several thousand dollars, there being 8,600 cubic yards of earth to be removed for the buildings, exclusive of the tunnels and footings for the walls.

Vancouver, B.C.

Campbell Bros. were awarded the con[illegible] Temple. Secretary R. P. Pettipiece.

Victoria, B.C.

[illegible] not heating, bids for which have been de[illegible] Brace.

Residences

Brandon, Man.

A building permit has been granted to [illegible] for residence on Lorne avenue, [illegible].

Brantford, Ont.

A building permit has been issued to T. J. [illegible], brick dwelling on Murray street, [illegible].

Hamilton, Ont.

Recent building permits include: R. [illegible], brick dwelling on Homewood avenue, [illegible]; J. P. Shepherd, three brick dwellings on the corner of Main and Park streets, [illegible].

Montreal, Que.

Tenders will be received until April 16th for a residence to be erected on Ontario avenue for Mr. J. M. Wilson. Saxe & Archibald, architects, 59 Beaver Hall Hill.

Tenders have been received for alterations to a residence on St. Famille street for Doctor England. MacVicar & Heriot, 104 Union avenue, architects.

Tenders are invited for the construction of a country house at Ste. Jeanne Ile Perrot, Quebec for Mr. L. Lemieux. Messrs. MacDuff & Lemieux, architect, Quebec Bank Building.

Tenders were received until April 12th for the erection of three flats on St. Hubert street for Mr. Victor Martineau. Dalbe Viau, architect, 76 St. Gabriel street.

Tenders will be received until April 16th for the erection of three flats on Alwyn street, for Mr. O. Cardinal. Dalbe Viau, architect, 76 St. Gabriel street.

Plans and specifications will be prepared and tenders will be received up to April 20th for the erection of an apartment house on Fort street for Mr. H. S. Phillips. Theo. Daoust, architect, 103 St. Francois Xavier street.

Mr. E. Payette, architect, 15 St. James street, is preparing plans for alterations to a house at St. Margaret, Que., for Dr. R. Masson.

Dalbe Viau, architect, 76 St. Gabriel street, is preparing plans and specifications for an apartment house to be erected on Boulevard St. Joseph for Mr. J. A. Jarry.

Outremont, Que.

Recent building permits include: L. A. Lapierre, residence, Boulevard street, St. Joseph, cost $8,000; A. C. Miller, cottage, MacDougall avenue, cost $4,500; G. Fellows, three cottages, Wiseman avenue, cost $15,000; Geo. Goodbody, six pairs of semi-detached houses, Derippe street, cost $33,000.

Plans have been prepared and tenders are being invited for the erection of a house on MacDougall avenue for Mr. H. S. Thomas. Philip J. Turner, F.R.I.B.A., architect, Board of Trade Building, Montreal.

Peterborough, Ont.

A building permit has been issued to W. H. Baker pressed brick dwelling on Rubidge street, $3,500.

Renfrew, Ont.

Tenders were called for April 13th for various trades required in the erection of dwelling house for J. A. Allan. Plans, etc., at office of the architects, Weeks & Keefer, Free Press Building, Ottawa.

St. Lambert, Que.

Tenders are being called for additions to residence for W. B. Powell. Philip J. Turner, F.R.I.B.A., architect, Board of Trade Building, Montreal.

Vancouver, B.C.

Building permits have been granted to Mr. John A. Seabolt, for a 3 storey apartment house on the corner of Davis and Jervis streets, to cost $85,000; also another to the Hose Investment Company for 5 storey apartment, 50 x 20, fireproof. A. J. Bird, architect, 79 Hastings street.

Winnipeg, Man.

A building permit has been issued to Messrs. Carson, Falkner & Ladell for the erection of an apartment block one the north side of Buell street between Home and Arlington, $25,000.

Purcer Bros. are building six residences at an average cost of $4,400, on Dorchester avenue.

MacMillan & Vollans have secured a permit for the erection of an $80,000 apartment block at the corner of Cumberland and Kennedy.

AWARDED.

Welland, Ont.

Cozy Homes, Limited, have let the contract for the construction of twelve houses on Division street, east of Queen, three of which will be built at once. Average value, $1,200.

Strathcona, Alta.

Wolfe, Howe & Baldwin have the contract for the erection of residence for Major G. W. Marriott. Herrald & Wilson, architects.

Business Buildings and Industrial Plants

Belleville, Ont.

The 4 storey grist mill, on Moira street, owned by the Carlaw Milling Company, was damaged to the extent of about $30,000 recently.

Brandon, Man.

A building permit has been granted to Beatty Bros. for a brick warehouse on Pacific avenue to cost $10,000.

The Western Canada Flour Mills Company have announced their intention to add another storey to their warehouse here.

A building permit has been granted to Ald. B. D. Wallace for the erection of a brick office on Eleventh street, cost $2,500.

Brantford, Ont.

It is understood that the Cockshutt Plow Company will in the immediate future make some large extensions to their plant.

Mr. R. M. Jaffray, of Detroit, has been investigating as to the advisability of locating an automobile factory here in which he is interested.

Calgary, Alta.

Judge Travis, Beveridge Bros. and Geo. Bryan will erect a five storey block here, work to commence immediately. Cost, $25,000.

Collingwood, Ont.

Architect Wilson is preparing plans for a 2 storey brick addition, 50 x 100 feet, for Mr. H. Poehlman, to be erected on a portion of the Toner & Gregory property on First street.

Large and important extensions in the way of office building, second factory, etc., are among the plans of the Bryan Manufacturing Company here. F. W. Bryan, president; W. T. Herrington, secretary-treasurer.

Craik, Sask.

The time for receiving tenders for erection of Farmers' Elevator has been extended to April 23rd. E. A. Phipps, secretary-treasurer.

Dalny, Man.

The Scott elevator was destroyed by fire recently. Loss, $10,000.

Edmonton, Alta.

The permit for the new Canada Permanent Mortgage Building has been taken out, $60,000. Tenders are also being called for the new National Trust Company Building, $50,000.

Enderby, B.C.

The Bank of Montreal will erect a reinforced concrete building this summer.

Fort William, Ont.

It is stated that a site has been selected for the hardwood plant for Messrs. Seaman & M. Kent, of the Seaman, Kent Company, Meaford, Ont., for which plans have been approved.

Fort Frances, Ont.

L. Christie will erect a $10,000 block.

Granby, Que.

J. Bruce Payne Cigar Company, Limited, are erecting an addition to their factory with frontage of 45 feet on Queen street by 80 feet in depth and three storeys high. Material, concrete.

Kelowna, B.C.

Fire destroyed the warehouse and offices of S. T. Elliott here recently. The loss is $16,000.

Kenora, Ont.

Mr. Bain, surveyor for the Hudson Bay Company, has surveyed the site for the new mill and plans have been submitted to the council.

London, Ont.

It is reported that Hon. Adam Beck's box manufacturing company will establish a branch at Winnipeg, Man.

It is reported that the Barker property, between Clarence street and Wellington street, on Dundas, will be torn down and a large new building erected. Leases expire on April 1, 1911.

Moose Jaw, Sask.

Tenders addressed to T. W. Robinson Company, Limited, will be received until April 15th for alterations and additions to their Main street store. Plans, etc., at office of Elliott & Gorman, architects.

Montreal, Que.

Selected tenders will shortly be invited for the construction of the new office and factory building to be erected for the Holland Varnish Company.

Messrs. Findlay & Spence, architects, 59 Guardian Building, are preparing plans for the extensive remodelling of Kastel's restaurant on St. Catherine street west.

Tenders have been received by MacVicar & Heriot architects, 10. Union avenue, for the general contract for alterations to the premises at 138 Peel street for R. J. Inglis.

Tenders will be received unti April 14t on plans for alterations to the premise at 416 St. Catherine street for F. Matthe & Company. MacVicar & Heriot, architects, 104 Union avenue.

Selected bids are now being invited t figure on the general contract for the ere tion of a new building for the Montrea Steel Works, Limited. T. Pringle & So Limited, architects, Coristine Building.

Plans and specifications have been pre pared and tenders are invited until Apr 14th for alterations to Cigar Box Factor on Jurors street, for Adam Beck, Es

Hutchison, Wood & Miller, architects, Royal Insurance Building.

Messrs. Willis & Company, Limited, have had plans prepared for the erection of an eight storey building on the southwest corner of St. Charles and Drummond streets on the site of the premises now occupied by Mr. J. A. Harte's drug store. Ross & McFarlane, architects.

The rumor is again current that the extensive down town property, formerly occupied by S. Carsley & Company, Limited, fronting both on St. James and Notre Dame street will be transformed into a modern hotel building. This large block is at present unoccupied.

The Chas. Thackeray Company, general contractors, are the lowest tenderers for the construction of the reinforced concrete building to be erected on the Blumenthal estate, St. Catharine and Balmoral streets, and it is expected that the contract will shortly be awarded to them. Ogilvie & Mitchell, associated architects, Molsons Bank Building, St. Catharine street.

New Liskeard, Ont.

Mr. O. H. Moxley is building a new mill, foundation of which has been laid.

New Westminster, B.C.

Contracts have not yet been let for the main building of the new B. C. E. R. station on Columbia street; it is understood that plans call for red brick and granite, with interior of tiled boors and marble walls.

North Vancouver, B.C.

Mr. Walter Ker, of Vancouver, and Mr. David Ker, of Victoria, representatives of the Brackman-Ker Milling Company, have been looking over the prospects relative to erecting a large office and store rooms on their property on the Esplanade.

Orillia, Ont.

E. Webb has the superintendence of the erection of the new Tudhope carriage factory, which will be four storeys high, 162 x 77 feet, and of brick and slow burning construction.

Peterborough, Ont.

A building permit has been granted to the Quaker Oats Company for a brick storehouse, cost $80,000; contractors, Leonard Construction Company. It is expected that the building will be completed by October.

Port Colborne, Ont.

A by-law granting aid to the Canadian Cork Company, Limited, will be submitted to the ratepayers on April 29th. The company intend to build a $30,000 factory.

Portage la Prairie, Man.

It is understood that a representative from the Rogers Fruit Company will shortly arrange for the erection of their distributing warehouse on Tupper street, which is to be of brick, 90 x 100 feet.

Quebec, Que.

It is reported that the Bank of Montreal has secured the corner of St. John and Palace streets as a site for the erection of their new branch.

The Canada Gazette announces the incorporation of the Dominion [illegible] Company, headquarters at Quebec, capital [illegible]. The incorporators are Sir Thomas Shaughnessy and Mr. Hugh Andrew Allan, of Montreal, George D. [illegible] and William M. Dobell, of Quebec; Walter E. Foster, of St. John, N.B., Baron Pirrie, of Belfast, and Sir Robert W. Perks and Arthur M. Grenfell, of London, England. The company is empowered to carry on the general business of shipbuilding and ship-repairing, building and operating drydocks and subsidiary undertakings. It is proposed to build plants at Levis, and St. John, N.B., within the year.

Qu'Appelle, Sask.

Surgeson Bros. machine works were destroyed by fire on the 5th inst. Loss, $20,000.

Red Deer Alta.

The Merchants Bank has purchased two 25 feet lots.

Saskatoon, Sask.

C. H. Stephenson, merchant, will build a $20,000 block here.

St. Boniface, Man.

The store occupied by John Barkwell, 139 Tache avenue, was destroyed by fire on the 3rd inst. Estimated loss, $2,500.

St. Thomas, Ont.

Architect N. R. Darrach has prepared plans of the proposed new factory for the Nursery Shoe Company, to locate here provided the ratepayers endorse the loan of $15,000 to the company on April 18th. Plans call for a building 40 x 120 feet, and will contain general offices and the various workrooms. It will be so constructed that additions can be made to it at any time. Noted in last issue.

Tilbury, Ont.

As soon as the fire losses are adjusted work will be commenced on the rebuilding and repairing of the three blocks damaged by fire recently.

Toronto, Ont.

The warehouse of the Salada Tea Company at 32 Yonge street was badly damaged on the 11th inst. Estimated total loss, $50,000. P. C. Larkin, president.

The Bank of Toronto recently purchased 20 feet 8 inches by 95 feet lot on the northwest corner of Yonge and Charles streets, on which they will erect a branch office.

Tenders addressed to A. L. Hertzberg, division engineer, will be received until April 20th for the construction of a new station building, North Parkdale (C. P. R.)

The northeast corner of Dovercourt road has been purchased as a possible site for a new departmental store. W. O. McTaggart & Company, 979 Bloor west, effected the sale.

Uxbridge, Ont.

Tenders will be received by [illegible] for the erection of a bank building.

Vancouver, B.C.

Building permits were granted to The Home Investment Company, five storey block, Hornby street, between Nelson and Helmcken, cost $75,000; Mr. J. A. Seabold, covering a three storey block at 1311 Davie street, costing $78,000.

Vermilion, Alta.

The Canadian Slate Products Company, capitalized at [illegible], as soon as the necessary formalities of incorportion takes place, will commence the erection and installation of plant [illegible] estimated to cost about $1,000,000.

Victoria, B.C.

It is announced that negotiations are in progress between the G. T. P. and the Hudson Bay Company for the acquisition of property on [illegible] street, on which the former may erect a new hotel

Warwick, Que.

[illegible]

destroyed by fire on the 7th inst. Estimated total loss, $50,000.

Windsor, Ont.

It is reported that D. W. Murray, of Johnstown, Ohio, representative of a firm which manufacture sheet brass fittings for automobiles, has purchased property on the corner of Sandwich street and Louis avenue.

Winnipeg, Man.

It is reported that negotiations are in progress for the erection of a cement mill in the city by the Canada Cement Company.

The Coleman Baking Company, of Toronto, will build a bakery 90 x 132 feet on 666 Elgin avenue, to cost $50,000. W. C. Parnell, western manager.

Gowans Kent Western, Limited, it is stated, have completed arrangements for the erection of their 6 storey warehouse on Market street, 50 x 157 feet feet, of reinforced concrete. F. S. Parlee, western manager. Noted in issue of February 16.

J. D. Atchison, architect, is preparing plans for the new Eastern Townships Building. Plans call for a frontage of 45 feet on the east side of Main street, with front 40 feet in height, of a handsome granite. Building operations will commence on May 1st.

Tenders are now being called for interior finishings on the upper three storeys of the Union Depot, to be occupied by the G. T. P. and C. N. R. Estimates of architects preparing plans for finishing show that the work will amount to a quarter of million dollars over and above the contracts already let.

Yarmouth, N.S.

The Higins shoe factory was destroyed by fire on the 4th inst. Estimated total loss, about $30,000.

AWARDED.

Collingwood, Ont.

The Sheldon Manufacturing Company have the contract for the equipment of the dry kiln to be erected for the Bryan Manufacturing Company.

H. G. Wynes has the contract for the cement foundations for the new buildings being erected for C. Stephens Company. J. Wilson, architect.

Edmonton, Alta.

The contract for the Canada Permanent Company's new $65,000 office building on McDougall avenue has been awarded to Pheasy & Batson.

Halifax, N.S.

M. S. Brown & Company have awarded the contract for an addition to their building to Freeman Bros.

Kelowna, B.C.

Mr. Geo. E. Ritchie has secured the contract for the erection of a $6,000 cannery building for the Kelowna Canning Company. Construction will commence shortly.

Montreal, Que.

We are informed that the amount of contract awarded to Bishop Construction Company for C. P. R. viaduct Windsor street station, is $75,000.

The contracts for the erection of a building at 1203 St. Denis street have been awarded as follows: Excavation and concrete work, S. F. L. Dusablon & Company; plumbing, heating, painting, etc., A. Mer[illegible].

The [illegible] awarded to date in connection with the erection of the new plant for the Shaw

Continued on page [illegible]

Tenders and For Sale Department

To Contractors

[illegible] or bulk bids will be received [illegible] up to 12 o'clock noon of [illegible] APRIL, 1910, for all the work [illegible] the erection of a new [illegible] Royal Victoria Hospi- [illegible]

[illegible] specifications may be obtained at the Hospital or at the office of the [illegible]

The lowest or any tender will not necessarily be accepted.

F. S. BAKER, Architect,
15 Traders Bank Bldg., Toronto.

The City of Calgary

Tenders will be received by the City Com- [illegible] up to and including APRIL 22ND, 1910, at 4 o'clock p.m., for supplying the City of Calgary with the following material:

Salt Glazed, Vitrified Clay Sewer Pipe, according to specifications to be furnished by the City Engineer. Tender to state price, f.o.b. Cal- [illegible]

A marked cheque for $100 to accompany each tender.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary March 17th, 1910. 16

Department of Railways and Canals, Canada

Sault Ste Marie Canal

Notice to Contractors

Sealed tenders addressed to the undersigned and endorsed ''Tender for Removing Range Beacon, and widening the Channel at the Upper Entrance,'' will be received at this office until 16 o'clock on THURSDAY, THE 28TH APRIL, 1910.

Plans, specifications and the form of the contract to be entered into, can be seen on and after the 8th April, 1910, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Engineer in Charge, Sault Ste. Marie, Ont., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages Schedule prepared or to be prepared by the Department of Labour, which schedule will form part of the contract,

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $500.00 made payable to the order of the Minister of Railway and Canals, must accompany each tender, which sum will be forfeited if the party tendering decline entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfillment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 8th April, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 16

YORKTON, SASK.

Tenders for Concrete Sidewalk

Tenders will be received by the Secretary-Treasurer of the Town of Yorkton, Sask., until MONDAY, APRIL 25TH, 1910, for the furnishing of all material and the construction of approximately 80,000 square feet of concrete sidewalk. Particulars may be had on application to the Town Engineer. A marked cheque for $300 to accompany each tender. Lowest or any tender not necessarily accepted.

F. T. McARTHUR, B.Sc.,
15. Town Engineer.

City of Brandon

Sealed tenders will be received by the City Clerk, Brandon, Manitoba, ''Endorsed Tender for Road Roller,'' until 12 o'clock noon on MONDAY, THE 25TH DAY OF APRIL, inst., for a Steam or Gasoline Road Roller, weight 12 tons.

Proposals must contain full specifications.

Roller to be delivered f.o.b. Brandon, freight and duty paid,

The lowest or any tender not necessarily accepted.

R. E. SPEAKMAN,
City Engineer.

Brandon, April 9, 1910. 16

The City of Calgary

Tenders will be received by the Commissioners of the City of Calgary up to and including the 22ND DAY OF APRIL, 1910, at 4 o'clock p.m., for the construction of the following works, according to plans and specifications to be furnished by the City Engineer:

Five miles of sewer, inculding pipe,

Three miles of water mains, city supplying pipe.

A marked cheque for $500 to accompany each tender.

A bond of maintenance for one year signed by a satisfactory surety company to be delivered when work is completed.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary, 17th March, 1910. 16

City of Port Arthur

Pavement Construction

Sealed tenders addressed to the undersigned and endorsed on envelope, ''Tenders for Pavement Construction,'' will be received up to 12 o'clock noon of

Saturday, April 30th, 1910

for aproximately 50,000 square yards of Sheet Asphalt or Asphalt Block Pavements on concrete foundation.

Plans, profiles, specifications and forms of tender are on file in the City Engineer's office, and specifications and forms of tender may be obtained from the City Engineer and any further necessary information.

A marked cheque for 10 per cent. of the estimated cost of the paving must accompany tender.

The cheques of unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

J. McTEIGUE,
City Clerk.

Corporation Offices, Port Arthur,
April 7th, 1910. 16

City of Brantford

Tenders for Reinforced Concrete Bridge

Sealed tenders addressed to Ald. Joseph Minshall, in care of the City Clerk, Brantford, Ontario, will be received till 12 o'clock noon on

Friday, April 22nd, 1910

for a reinforced concrete bridge across the Canal on Market street The bridge will consist of one 60 foot arch span and aproaches, one 46 foot girder span, one 42 foot girder span and two 36 foot girder spans, all of reinforced concrete Length of bridge, 246 feet Width, 64 feet

Plans and specifications may be seen and instructions to bidders and forms of tender obtained at the office of the City Engineer. Each tender must be accompanied by a marked cheque for $1,000 payable to the order of the City Treasurer.

Copies of the plans and specifications may be seen at the offices of the ''Contract Record,'' Confederation Life Building, Toronto, and at B34 Board of Trade Building, Montreal.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.

City Engineer's Office,
Brantford, April 5th, 1910. 16

Department of Railways and Canals, Canada

Trent Canal

Ontario-Rice Lake Division
Section No. 6

Notice to Contractors

Sealed tenders addressed to the undersigned, and endorsed ''Tender for Trent Canal,'' will be received until 16 o'clock on TUESDAY, THE 26TH APRIL, 1910, for the works connected with the construction on Section No. 6, Ontario-Rice Lake Division of the Canal.

Plans, specifications and the form of contract to be entered into, can be seen on and after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Superintending Engineer, Trent Canal, Peterboro, Ont., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages Schedule prepared, or to be prepared by the Department of Labour, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signatures, the nature of the occupation and the place of residence of each member of the firm.

An accepted bank cheque for the sum of $10,000. made payable to the order of the Honourable the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent will be returned to the respective parties whose tenders are not accepted.

The cheque of the successful tenderer will be held as security or part security for the due fulfillment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 5th April, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.

City of Woodstock

Concrete Sidewalk

Tenders addressed to John Morrison, City Clerk, Woodstock, will be received up to SATURDAY, THE 23RD inst., at 10 a.m., for the constructing of concrete sidewalks during the season of 1910.

Specifications and further information at my office.

The lowest or any tender not necessarily accepted.

F. J. URE,
City Engineer. 15

PLANT FOR SALE

One No. 3 Gates crusher, complete.
Three revolving stone screens.
110 elevator buckets.
One 70 h.p. Loco fire box boiler.
One 30 h.p. Loco fire box boiler, on wheels.
One 25 h.p. Loco fire box boiler, on skids.
One 12 h.p. "Champion" boiler and engine.
One single drum Buffalo horse power.
One double drum horse power.
26 pairs 18-inch car wheels with axles, 3-foot 6-inch guage, with boxings.
A lot of derrick castings and irons.
Wire guys.
One piece of shaft, 3 7-16 inch by 13 feet 9 inches.
One piece of shaft, 2 15-16 inch by 12 feet.
One D. S. D. D. Steam Hoist.
Some belt pulleys.

J. C. INGLES,
16. Hagersville, Ont.

Department of Railways and Canals, Canada

Trent Canal

Ontario-Rice Lake Division
Section No. 4

Notice to Contractors

Sealed tenders addressed to the undersigned, and endorsed "Tender for Trent Canal," will be received until 16 o'clock on THURSDAY, THE 5TH MAY, 1910, for the works connected with the construction of Section No. 4, Ontario-Rice Lake Division of the Canal.

Plans, specifications and the form of the contract to be entered into, can be seen on and after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Superintending Engineer, Trent Canal, Peterboro, Ont., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages Schedule prepared, or to be prepared by the Department of Labour, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signatures, the nature of the occupation and place of residence of each member of the firm.

An accepted bank cheque for the sum of $20,000.00 made payable to the order of the Honourable the Minister of Railways and Canals must accompany each tender, which sum will be forfeited, if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent will be returned to the respective contractors whose tenders are not accepted.

The cheque of the [illegible] tenderer will be held as security, or part security for the due fulfillment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 7th April, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 14

To Contractors

Sealed bulk or separate tenders endorsed "Tender for Town Hall" and addressed to Mr. J. McArthur, Township Clerk, Beaverton, Ont., will be received until noon on

Monday, April 25th, 1910

for all trades, in connection with a proposed new Town Hall and market at Beaverton, Ont. Plans and specifications may be seen, on and after April 4th, and form of tender obtained at the office of W. F. Shepherd and J. Harvey Self, associated architects, 436 Yonge street, Toronto, or at the office of the Township Clerk, Beaverton.

A marked cheque for $50.00, payable to the order of J. McArthur, Township Clerk, Beaverton, must accompany each tender and will be retained as security for immediate execution of a construction contract and satisfactory guarantee bond. Deposit cheque of tenderers will be returned if unsuccessful, or, if successful, on execution of construction contract and guarantee bond. Neither the lowest nor any tender will necessarily be accepted.

JOHN McARTHUR,
15 Township Clerk.

Piers, Abutments and Concrete Floor Slabs

Wilton Ave. Bridge

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on TUESDAY, APRIL 19TH, 1910, for the construction of Piers, Abutments and Concrete Floor Slab for a Bridge on the extension of Wilton avenue crossing over the River Don.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications may be seen and forms of tender obtained at the office of the City Engineer, Toronto.

The usual conditions relating to tendering, as prescribed by the city by-law, must be strictly complied with or the tenders will not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman, Board of Control.

City Hall, Toronto, April 4th, 1910. 15

Temiskaming and Northern Ontario Railway Commission

[illegible] [illegible]ers addressed to the undersigned, and endorsed [illegible] ger Station at [illegible] up to 12 o'cl[illegible]

Plans and [illegible] architect, 14 Leader Lane, Toronto, Ont., and the office of the Chief Engineer, North Bay, Ont.

[illegible] to the order of the Secretary [illegible] total amount [illegible] tender.

[illegible] cepted.

A. [illegible]

[illegible] 1

Notice to Contractors

For the Supply of Cast Iron Water Pipe for the Year 1910

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on TUESDAY, APRIL 19th, 1910, for the supply of 3, 4, 6, 8, 10 and 12 inch cast iron water pipe for the year ending April 30th, 1911.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained at the office of the City Engineer upon application.

The usual conditions relating to tendering as prescribed by City By-Law must be strictly complied with.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman Board of Control,

City Hall Toronto, April 4th, 1910. 15

Positions Vacant

WANTED—ARCHITECTURAL DRAFTSMAN, good all-round man. Steady employment if services prove satisfactory. Send references, state experience and salary wanted. Address Box 953, Contract Record, Toronto. 15

Positions Wanted

ARCHITECT'S MANAGING ASSISTANT, 16 years, first class experience (London and Glasgow), used to taking full charge, desires change; well up in banks, office blocks, domestic, etc. Further particulars—Hunter, 53 Thornwood Drive, Glasgow, Scotland. 15

Miscellaneous

GOOD SECOND HAND HYDRAULIC HOIST complete, capacity 2½ tons. For sale, very cheap. Apply to R. J. Dodds, 16 King street east, Toronto, Ont. 15

FOR SALE—Eighty-eight (88) pieces of Lackawanna Steel Sheet Piling, twenty-two (22) feet long, twelve and three-quarter (12¾) inches wide, three-eighths (⅜) inch thick. WM. [illegible] 15

New Companies

The [illegible] Lumber Mills Company, Limited, Montreal, Que., capital [illegible]. Incorporators, [illegible] Montreal, Que.

The Verdun [illegible] Company, Verdun, Que., capital [illegible]. Incorporators, [illegible]

La Compagnie Gaulin, Limited, St. Francis, Que., capital $125,000. Incorporated to construct railway locomotives, electric or steam cars, etc. Incorporators, Alfred Gaulin, manufacturer, St. Francis, Que., and [illegible] Que.

Canadian Hoskins, Limited, Walkerville, Ont., capital $10,000, incorporated to manufacture, operate and deal in electrical machines such as electric furnaces, pyrometers, etc. Incorporators, Alfred Leroy [illegible] Talman, manufacturer, both of Detroit, Mich.

Business Buildings and Industrial Plants

(Continued from page 29)

[illegible] Cotton Company, Shawinigan Falls, Que. General contract, C. E. Deakin; reinforced concrete [illegible], J. F. Jago & Company; iron [illegible], Canada Iron Corporation, Limited. T. Pringle & Son, Limited, architects, Coristine Building.

[illegible] have been awarded as follows for the erection of factory buildings and [illegible] J. [illegible] & Company 222 Plessis street: Excavation and masonry work, F. L. Dusablon; brick work, S. Rochon; carpentry, and joinery, U. Pauze & Fils; plastering, J. Lefebvre; painting and glazing, [illegible]; vault doors, Ahern Safe Company; stable fittings, Warden, King Limited. Eugene Payette, architect, 15 St. James street. Estimated cost, $90,000.

Contracts have been awarded as follows in connection with the erection of a new factory building for the Walter M. Lowney Company of Canada, Limited: Masonry and brick work, Messrs. Byers & Anglin; carpentry work, D .M. Long; steel work, Phoenix Bridge Company; concrete work, Messrs. Lewis & Ross; painting, A. Craig; roofing, Geo. W. Reed & Company; plumbing, James Ballantyne; ornamental iron work, Jno. Watson & Company. Hutchison, Wood & Miller, architects.

New Westminster, B.C.

The Fraser River Lumber Company has awarded to S. H. Abbott, of Seattle, contract for a nine mile extension of its standard gauge logging railway in the Comox district. Construction work is now in progress. Cost of construction, about $10,000 a mile. The company has just ordered 100 logging cars from the Dominion Car Company, Montreal, and two additional Baldwin locomotives from the Baldwin works at Philadelphia, delivery being called for in September.

Three Rivers, Que.

The general contract for the erection of additions to the Wabassa Cotton Company's new buildings has been awarded to C. E. Deakin, general contractor, Montreal; T. S. Pringle & Son, Limited, architects, Coristine Building.

Toronto, Ont.

The Sanitary Floor Company, 544-546 King street west, have the contract for the factory floors in the new premises of Heintzman Company, Yonge street.

Power Plants, Electricity and Telephones

Aylmer, Ont.

The residents favor the establishment of a municipal lighting plant, electricity to be generated by a steam plant, perhaps in conjunction with the waterworks plant. J. Bradley, town clerk.

Bracebridge, Ont.

Tenders are being called until April 15th by the Bracebridge & Muskoka Lakes Telephone Company Limited, for construction of telephone line from Port Carling to Bala. For particulars apply to P. Hutchison, this place.

Edmonton, Alta.

The new power house erected last fall is showing signs of collapse and it is likely that the walls will have to be razed and reconstructed of brick.

Fort Frances, Ont.

The special committee appointed to deal with the telephone question recommended that plans be prepared and tenders called by the town for the installation of a modern plant.

Peterborough, Ont.

It is stated that the proposed extension to the plant of the Canadian General Electric will be built. This was decided at a joint meeting of the City Council and Water Commissioners, when the company's offer was accepted. Noted in last issue.

Regina, Sask.

Tenders addressed to S. P. Porter, Deputy Minister Railways, Telegraphs and Telephones, will be received until April 20th for telephone lines (1) Weyburn-Stoughton-Arcola; (2) Wapella-Carlyle; (3) Abernethy Melville Esterhazy, Wapella; (4) Saskatoon Warman, Humboldt; (5) Moose Jaw, Outlook.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman, Board of Control, will be received until April 19th for conduit. Specifications may be obtained from the Toronto Hydro-Electric System, City Hall.

Tenders for the mason work, roofing, plumbing, painting, for the new electric sub-station on the corner of Duncan and Nelson streets will be received until April 19th by G. R. Geary, chairman Board of Control. Plans, etc., at office of the City Architect.

Winnipeg, Man.

The power construction engineers have recommended to the Board of Control the tender of J. W. McKinley, reeve of Springfield, for the erection of the fence for the power transmission line right of way, although the said tender is not the lowest.

Tenders addressed to the Chairman of the Board of Control will be received until April 30th for supply of arc lamps and regulating apparatus, switchboards and accessories insulated line wire and mast arm parts. Specifications, etc., at office of city electrician. M. Peterson, secretary, Board of Control.

AWARDED.

Chilliwack, B.C.

J. W. Pike, of Vancouver, has been awarded the contract for building the Sumas section of the B. C. E. R. Company's Chilliwack line.

Miscellaneous

Dartmouth, N.S.

Tenders are being called by the Ferry Company for a steel propeller boat and for a wooden side wheel boat according to plans on file in office, said plans having been made by the Lockwood Manufacturing Company.

Hamilton, Ont.

The following building permits have been issued: Thomas W. Reid, brick dwelling, Victoria avenue, for E. P. Smith, $2,300; J. Tulloch, brick dwelling on Spruceside avenue, $2,400; Arthur Bell, two storey brick store and dwelling on Barton street, $2,500.

Hanover, Ont.

The County Council of the County of Tay will consider a by-law to raise $20,000 for local improvements. John Rutherford, County Clerk.

Kingston, Ont.

The enlargement of Kingston harbor is under consideration. It is proposed to destroy the Cataraqui wooden bridge and to replace it with a new one half a mile northward with Belle Island, in Cataraqui river, as the centre of two new iron bridges. The Government, it is expected, would largely aid in the construction of bridges for military purposes.

Medicine Hat, Alta.

On May 9 the ratepayers will vote on the question of raising the following moneys by debentures: Sewers, $35,000; cement walks, $30,000; plank walks, $5,500; Medicine Hat Society, $10,000; municipal warehouse, $7,000; road making machinery, 20,000; parks, $36,000, or a total of $143,500. Later on in the year a vote will be taken to authorize the issue of debentures to the amount of $50,000 for the installation of an electric power plant.

Montreal, Que.

The part of the work announced to be undertaken this year by the Harbor Commission is as follows: A two million bushel elevator, $800,00; raising the railway tracks to high levels so as to be available in winter and summer both, $200,000; raising Victoria pier to high level, leaving part of the low level for river vessels, $400,000; the completion of the Dominion coal dock at the east end, $100,000. It is announced that a British firm will construct a floating dry dock with a lifting capacity of 25,000 tons and also a shipbuilding plant, the dry dock to be ready by the summer of 1911.

Ottawa, Ont.

Tenders are being called by the Department of Railways and Canals until April 26th for the works connected with the construction on Section No. 6 Ontario-Rice Lake Division of the Canal. For further particulars see advertisement in this issue.

Prescott, Ont.

The stables of Dr. J. D. Reid, M.P., were destroyed by fire on the 9th inst. Total estimated loss, $9,000.

Prince Albert, Sask.

Tenders addressed to C. O. Davidson, city clerk, will be received until April 16th for supply of cement for the year 1910, price to be f.o.b. cars Prince Albert, to be delivered in lots of 500 bbls. as ordered. Approximate amount required, 2,500 bbls.

Peterborough, Ont.

Tenders addressed to L. K. Jones, Secretary, Department of Railways and Canals, will be received until May 5th for the works connected with the construction of Section 4 Ontario-Rice Lake Division of the Trent Canal. Advertisement in this issue.

Sault. Ste. Marie, Ont.

Tenders addressed to L. K. Jones, Secretary, Department of Railways and Canals, will be received until April 28th for removing Range Beacon, and widening the channel at the upper entrance. See advertisement in this issue.

Truro, N.S.

The ratepayers have approved of the expenditure of $48,000 for town improvements.

Westmount, Que.

The proposed loan for local improvement was endorsed at the meeting of the Municipal Association, held on the 6th inst.

AWARDED.

Hull, Que.

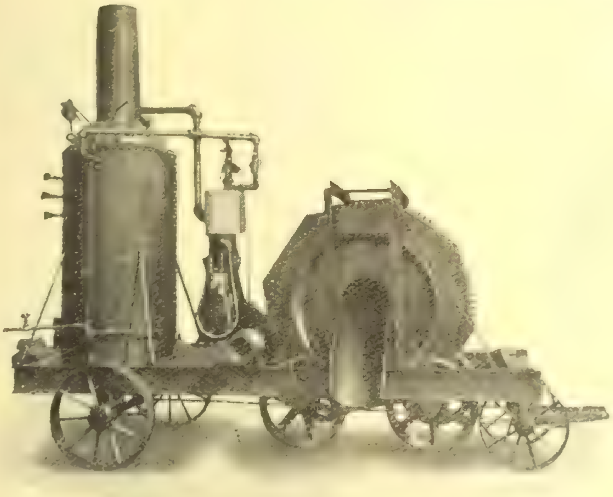
The tender of J. Lepine was accepted for the numbering of streets, 8 cents each; houses, 5 cents each; total, $2,500. Hull Equipment & Supply Company also tendered.

Ottawa, Ont.

The supply of asphalt for city plant has been awarded to the Barber Asphalt Paving Company at $27.80 a ton.

HADSEL

A mixer combining all the advantages of a continuous and is a batch mixer



The loading hopper on our one-half yard mixer has a capacity of one half-yard of **unmixed material.**

A strong feature. The gate between hopper and mixer is so arranged that while one batch is being mixed and discharged the laborers are busy filling the hopper.

When the mixing batch is discharged the engineer pulls gate allowing unmixed batch to run into mixer and then closes gate, immediately permitting reloading of hopper to proceed almost uninterruptedly.

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cut from the log in our own mills out of live Douglas Fir and creosoted to specification as to Oil and Pressure. Capacity 1,000 yards per day.

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Standard Creosoted Railroad Ties

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Vancouver, B. C.

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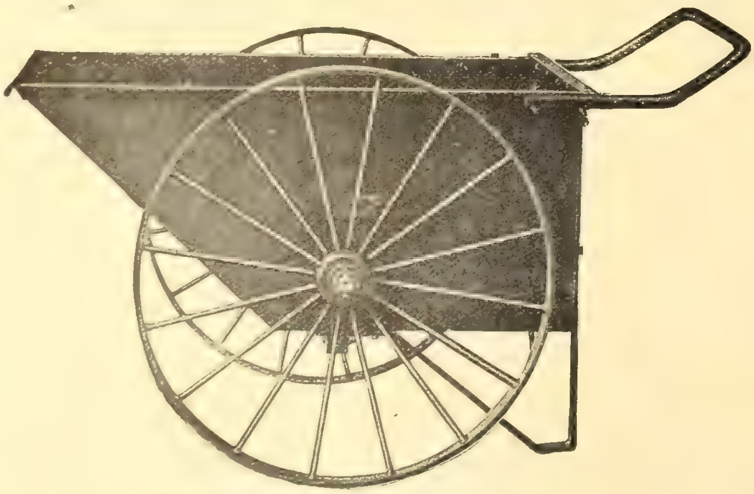

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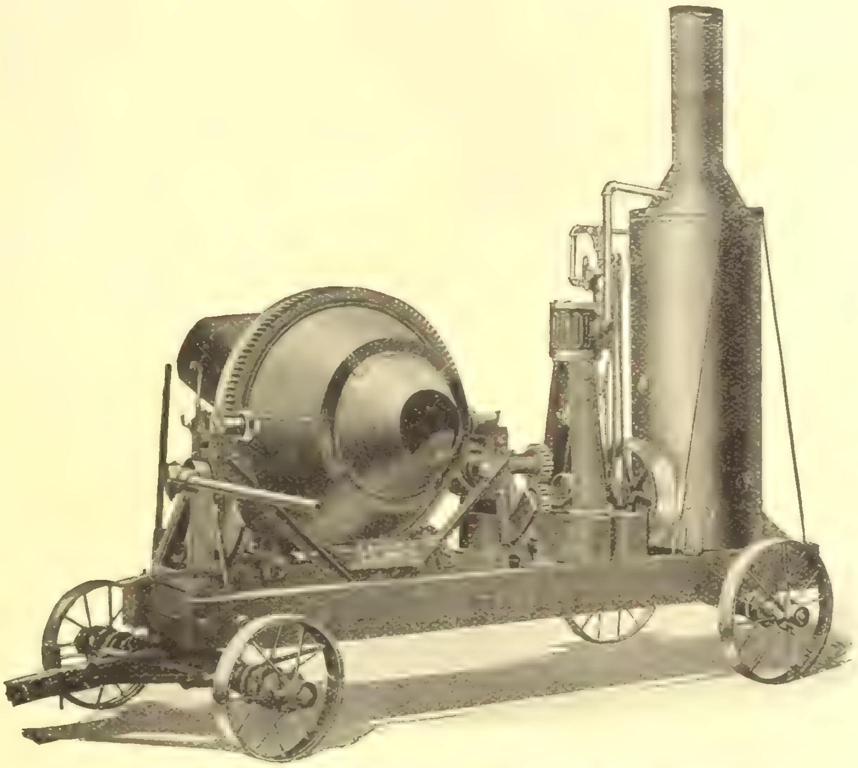

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ng Apparatus, Norton Jacks,
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Ideal Concrete Block Machines.

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Cobalt,	Opp. Right of Way Mine
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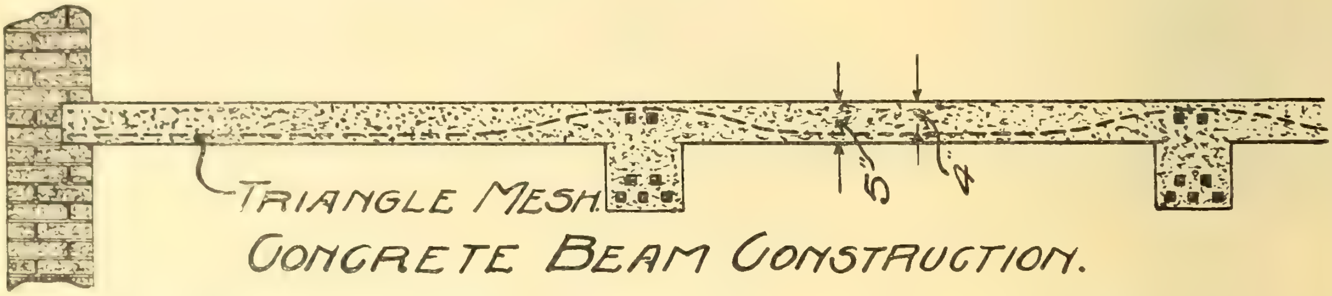
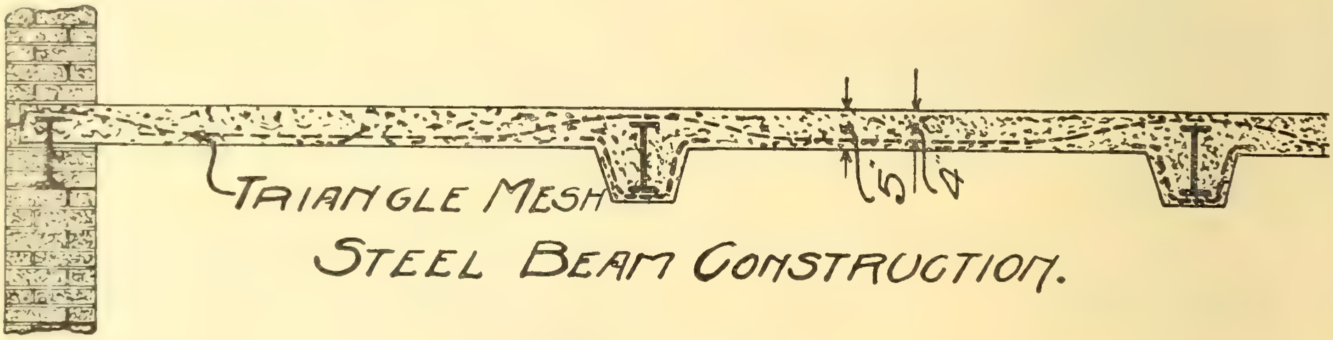
NOTE:—Stresses carried by heavy longitudinals. Diagonal cross members take care of temperature stresses and strains, distribute stresses evenly on longitudinals and assist longtitudinal members.

The only reinforcement in the market combining these special features of advantage. Made of cold drawn mild steel.



Detail of construction of span showing continuous bond and location of the triangular mesh reinforcement as applied to floor construction.



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Toronto - Canada

ESTABLISHED 1886
Contract Record
A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

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Vol. 24 Toronto April 13, 1910 No. 15

A Perennial Complaint

It is somewhat disconcerting to observe again this season, as for years past, indications of dilatoriness regarding construction work on the part of municipal officials and others. As we have pointed out before, the legal formalities and other preliminaries in connection with public improvements should be undertaken in the fall or winter instead of at the opening of the building season. Delay of the latter kind means that the competion of the project will not be effected until the fall, when the cost is increased by uncertain weather and scarcity of labor. That contracting interests can do something towards improving matters in this regard is exemplified by a letter sent out earlier in the season by the Illinois Association of Municipal Contractors to the various boards of local improvements throughout the State. From this communication we cull the following extract:

> Owing to the many advantages to be derived from an early award of contracts for municipal improvements and in view of the time necessary to follow the legally prescribed course of proceedings and secure confirmation of the court, we suggest an early start on proceedings for all contemplated improvements for the year 1910.
>
> Reports from many sections indicate that the coming season will be a very busy one, and we are prepared for a vigorous campaign to improve the Quality, Quantity and Efficiency of Public Improvements.
>
> We realize that in order to accomplish this, it will be necessary to secure a high degree of assurance in the legally prescribed procedure and proceedings, to eliminate from specifications conditions which are onerous to the contractor and wasteful to the public, to have estimates made sufficient to enable the contractor to employ the materials and construct the work as prescribed by your plans and specifications, at a fair profit, thus stimulating the market and demand for your bonds and protecting the contractor against unwarranted extractions and unreasonable discounts.

Nineteen hundred and ten is going to be a big year—the biggest yet in the ordinary course of events—and it will be positively sinful if contractors are impeded by the sloth of municipal officials. We would advise any of the latter who have been delinquent in this matter to put forth their best efforts and make up for lost time, if they do not wish to incur the anathema of the whole contracting fraternity.

Foreign Plans for Canadian Work

Considerable feeling has been aroused in western architectural circles over the practice of sending to the United States for plans of important buildings. The principal offenders in this regard are public institutions which exist by virtue of the business given them by the people of western Canada. It would seem that the architects themselves or their associations should have actively interested themselves in this question long ago. It is gratifying, however, to notice that the Manitoba Association of Architects is emulating the example of its sister society in Ontario and starting an active campaign against the custom. It is coming to this: that Canadian architects are being barred against their own field. American firms should have the opportunity to compete for important work on equal terms with Canadian practitioners, but surely if any preference is to be given it should be to our own people. The campaign which the architectural associations are inaugurating will be directed chiefly against American firms which have no resident offices in Canada. At the present time the duty on plans is insufficient to prevent the Canadian public from employing United States architects if they desire to do so. The Ontario Association is desirous of obtaining convincing data from contractors and others. When the necessary information is collected it will be placed before the provincial and dominion governments with a request for protective legislation.

A Logical Result

An Ontario township in perfectly good standing recently called for tenders on the reconstruction of a municipal hall. Upon inquiry we learn that not a single bid was received. What is the matter with this township? Is it the victim of a boycott or have the contractors in that vicinity more work than they can handle? It would be infra dig to mention the name of the township in this column, but a careful perusal of our contracts Department will possibly reveal its identity. In fairness to ourselves it must be said that tenders for the work were not advertised in the "Contract Record." The moral is plain.

Methods of Laying Concrete Under Water

Detailed Description of Extensive Operations on Quebec Canal System Construction of Five Miles of Concrete Wall Without Unwatering*

By H. R. Lordly, M. Can. Soc. C.E.

Before directly entering on the subject proper of this paper, it will be well to review briefly canal slope-wall construction, and particularly the conditions on the Lachine Canal which gave rise to the necessity of subaqueous work.

This historic waterway, in its various stages of enlargement, the construction and reconstruction of its prism walls, affords much information that may be useful in many branches of hydraulic work. It also proves one important point, viz., that with modern sized vessels, more powerful propulsion, and a greater requisite speed, earth embankments and small rip-rap must give way to concrete, and that in established waterways, where repairs must be made without unwatering, this new method of lining can be applied effectively and economically without interfering with navigation.

In the report of the International Waterways Commission, 1898, various methods of constructing canal embankments are discussed, but it is doubtful if, outside of the pitched stone, or rip-rap, used on the banks of the Manchester Ship Canal, any of the other methods described, such as earth embankments, with or without bermes, etc., would be of value on our Canadian canals, at least those of the standard size. In this connection it must be noted that a canal which has to be unwatered for short periods in the spring of each year, and which has earth embankments covered with light rip-rap, is likely to have these slide in and cause much damage. In this respect, ice is also a factor which must be considered.

One engineer, quoted in the above report, stated that a test had been made on a German canal with a lining of sand beton. Small slabs were moulded in boxes, and, when set hard enough, were placed in the wall. This plan was afterwards given up, and the blocks moulded on the banks, the thickness of the covering being about six inches. The proportions of the beton were one to ten, and it was only used at levels below water-line. The mixture was found too lean to be of value when exposed to the air.

Heavy Dry Masonry and Old Rip-rap Injured by Derrick Spud

On some French and Italian canals a covering of beton, made with hydraulic lime, has been used On canals of very small cross section an attempt at waterproofing this beton has been made by covering it with "chape," a mortar of Portland cement. All of the above work has been done in the dry.

It would appear that the construction of heavy concrete slope-walls in canals of the larger size, and particularly by a subaqueous process, has been first carried out in Canada, and the experience gained here should prove of value Vertical walls are also being built under water in the same manner.

Plate A shows sections of the various enlargements and deepenings of the Lachine Canal. No. 3 shows the section when, during the period from 1840 to 1870, the canal had a navigable depth of nine feet. The dotted line represents a section of the Manchester Ship Canal. No. 4 represents the section after the year 1870, and it is during this period that the question of slope-wall construction became an important one. Types 1, 2, 3 and 4 show the various kinds of protection used for the face of the slopes.

Originally the slope walls were rip-rapped, or pitched, as it is termed in England, largely with the stone excavated from the work. Some of this stone, which was of the nature of a dark shale, disintegrated, and under the increased wave action, due to steam towage and steam-propelled vessels, large areas of the walls were destroyed.

Concrete Belt Wall over Rock—Dry Masonry on Top

In 1898 it was decided to rebuild the damaged wall in heavy courses with crystalline grey limestone from the Caughnawaga quarries. The base of the new wall was about three feet thick, and the courses decreased one inch per foot of slope. Above the water line was a coping course, and on top of this a revetment of broken stone was placed, to take the wash of the steamers (Plate A, type 1). This work was carried on for a number of seasons during the period of unwatering, in the month of April. As there were upwards of seven miles of wall to rebuild, and the progress made by working only two or three weeks each year could not be otherwise than slow, it was seen that some other method must be adopted in order to hasten the protection of the banks. In 1904 the author, who was then in charge of the work, was instructed to prepare plans for rebuilding the walls in a more expeditious manner

The Superintending Engineer of the Quebec Canal Division, Mr. E. Marceau, approved of using concrete on the slope walls, and this material had already been very largely used in rebuilding the locks and the vertical walls at the entrance to the canal. By the use of concrete much skilled andexpensive labor could be dispensed with; stonecutters were difficult to get and harder to hold, particularly in the early spring time. The face of the slope wall is about 24 feet (slope 1 to 1). It was first decided to use a belt of concrete, 8 to 12 feet wide and 1 foot thick. This belt was to be placed in the middle section of the wall, leaving in any rip-rap below which was in good condition, and running the concrete all the way down in a column, 5 feet wide, to a firm foundation, at points about 24 feet centres.

---

*Extracted from paper read before the Canadian Society of Engineers.

From the 16-foot level, up, the ordinary limestone rip-rap, as originally designed, was to be used. With this plan of doing the work it seemed possible to provide for a considerable length of the concrete belt being placed rapidly, so as to permit the stonelayers to finish the work by the first of May, when the water was run into the canal, and also to save portions of the old rip-rap that were firm. The work was generally started by April 3rd or 4th, but usually it was difficult to get more than three good working weeks.

In the execution of this plan some difficulty was found in using mould boards for the face. They proved difficult to keep in place, and more expensive to handle than was anticipated. In some portions of the wall an attempt was made to use a stiffer concrete, about one foot thick, laid on without any forms, but this proved too slow. About a quarter of a mile was done in three weeks, although the rocky bottom of this particular portion of the canal did not require as much concrete as would be called for in other sections.

The method outlined above gave a higher class of wall, and more of it, in a limited time. By it also the cost of labor was reduced, thus offsetting to some extent the extra cost for cement.

The wall on the south side of the canal, upper reach, was steadily getting worse, and on the north side a number of leaks were in evidence. The method of doing the work in the dry had proved too slow, and some more rapid system had to be devised.

It was then proposed that the walls should be laid entirely in concrete, except the revetment, and that the whole work should be done without unwatering the canal and during the period of navigation.

Under-water concrete work had already been done in some minor cases on the canal, and one experience, that of the abutments of Black's Bridge, was taken as suggesting the possibility of successful subaqueous construction of the slope walls. In the spring of 1903, during the building of the north abutment of this bridge, just after the forms had been placed, the water in the river rose rapidly, until there was a depth of 23 feet over the foundation. Time did not permit of waiting for the water to recede. At first a wooden chute was used and the concrete dropped through it, but after one corner of the forms had been filled, the box was discarded, and the concrete was dumped from barrows directly on the edge of the filled portion and allowed to flow forward at its own natural slope. The slow movement of the concrete was the best guarantee against washing out of the cement. The water was cold, and the set retarded sufficiently to aid the work in preventing injury to the placed concrete while the successive batches were dumped on the top of the sloping mass in situ. There was no current in the canal, but, on account of the rise and fall of the water in the river, a slight undulating movement was experienced. This abutment, which had a width of from 14 to 8 feet, and a total length of 80 feet, was thus satisfactorily completed in time. The face of the wall, when the forms were removed, was found smooth and in perfect condition.

In lining the prism walls below water with concrete a different problem arose. Navigation was to be maintained; the current in the canal of about one mile per hour and the wash of passing vessels had to be provided for. The face of the wall is 24 feet, slope 1 to 1. The thickness of concrete required 18 inches, and, as mould boards would have to be used, there was a danger of the concrete clogging between the form and the projections of the old masonry wall, thus creating large voids. A method of preventing the clogging and forcing the concrete down in place had to be devised.

After some preliminary discussion, the contractors for the original work, Messrs. Haney, Miller, Quinlan & Robertson,

Typical Sections of Canal Prism Showing Various Stages of Enlargement

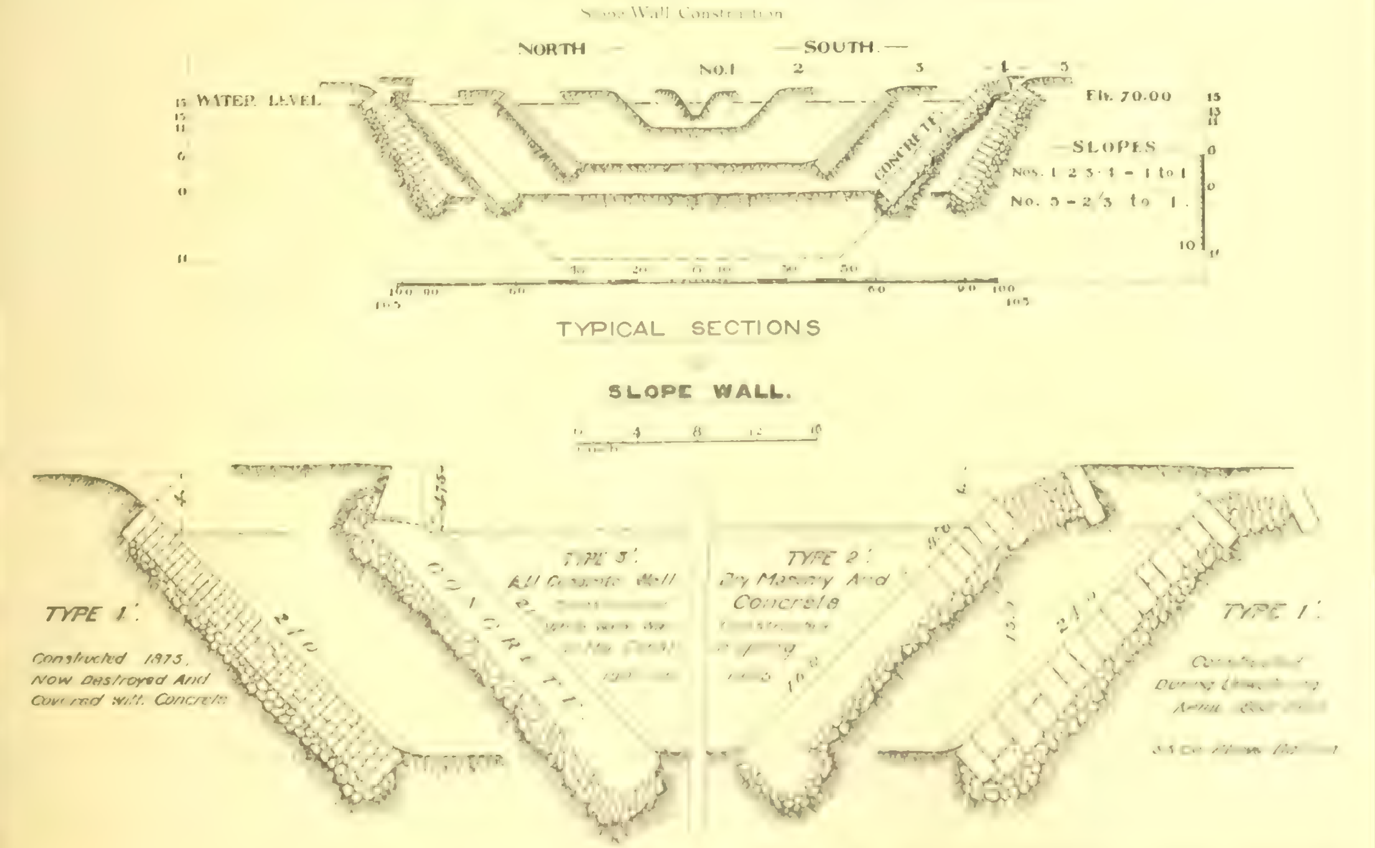


Plate A

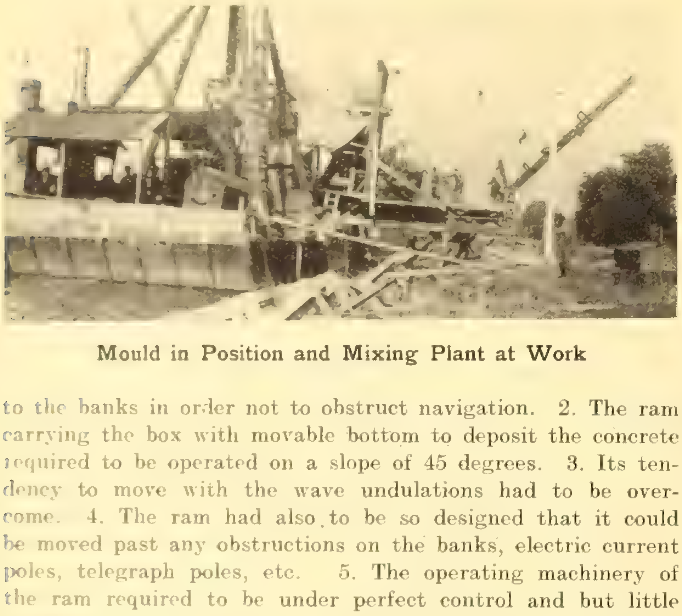
came forward with an offer to do the work under the above conditions and agreed to build the following plant: Six moulds or forms 100 feet by 24 feet face; a mixing plant, with a ram and box that would carry the concrete down between the wall and the forms; a lifting scow; a diving plant, etc., etc. The plant was calculated to do 200 yards per day.

It was proposed to prepare the toe of the walls during the spring unwatering. The forms were to be floated to the work during the period of navigation, placed by the aid of the lifting scow and divers, and heavily loaded at the bottom to remain in position.

Each form would be kept in place until the concrete was set sufficiently hard to permit of its removal, and would then be moved to the head of the line in order to continue the work. The designing of the forms and plant was placed in care of Mr. A. T. Gibson, the chief assistant engineer for the contractors.

While the resultant pressure behind the forms would not be great, their large size, the flotation to be overcome, and the force of the wash from passing steamers was sufficient to make the problem of their design and retention in place a difficult one. A special lifting scow for erecting and removing the forms was also required.

In designing the mixing and laying plant, which was to be on scows, some important points had to be considered. 1. The scows must be narrow and lay parallel (longitudinally) to the banks in order not to obstruct navigation. 2. The ram carrying the box with movable bottom to deposit the concrete required to be operated on a slope of 45 degrees. 3. Its tendency to move with the wave undulations had to be overcome. 4. The ram had also to be so designed that it could be moved past any obstructions on the banks, electric current poles, telegraph poles, etc. 5. The operating machinery of the ram required to be under perfect control and but little agitation of the water behind the forms created by its action.



Mould in Position and Mixing Plant at Work

In addition to the above, a supply bin, an automatic hoist and measure, to feed the mixer, had to be designed to suit the requirements of the work. A diving outfit and lifting scow, anchors for the moulds, etc., were also required. It will be thus seen that the conditions were many and somewhat difficult to overcome.

Moulds—The moulds were constructed of heavy timber, each mould being 100 x 22 feet, additional width being added at the top by placing longitudinal planks on the part out of the water.

Plate A gives a good idea of the method of construction and the details of the longitudinal trusses to give stiffness to the frame work. The heavy timbers were British Columbia fir. A platform or cradle was provided about five feet from the bottom of the mould to hold iron rails for ballast. The entire plan was carefully carried out, and, as will be seen later, the moulds were perfectly successful and rigid enough to be kept in nearly perfect alignment.

Measuring Car—The measuring car, about 32 cubic feet capacity, is shown in three positions, and its method of operation is well worth a careful examination. After being fed by the chute while in its lowest position, the cement being placed in from the side by hand, the car ascends the double-rail track and turns completely upside down. ((See position 2 and 3). The intermediate position between 2 and 3 would show the rear wheels, first in the air, free of any rail, and next engaging the rail, which carries it while dumping. This apparatus, as designed by Mr. A. T. Gibson, was one of the most efficient parts of the plant. The feed car dumped into the mixer hopper, and, after the materials were mixed, the concrete was dumped into a receiving hopper, from which the box on the ram was supplied. This supply hopper held about three batches of concrete, and allowed the mixer to be run almost continuously without depending on the speed of the ram, which was at times likely to be irregular. The face mould is shown in place, in this sketch, with its loading ballast and lower layer of concrete in process of filling in. The ram is in its highest position, the box being ready to receive its supply, about 12 cubic feet, from the hopper.

It will be noted that the strain on the ram arm is taken by a wire cable, operated with block and tackle by means of a winch from the frame above the mixer. A part of the frame is omitted from the sketch in order to show the measuring car. The additional illustrations will show the operating details more clearly.

Ram and Guide—It will be remembered that one of the problems of this undertaking was to place the concrete between the old masonry wall and the forms for the concrete facing without clogging up the space near the top, and thus creating voids at the bottom of the wall. Had the thickness of the new wall been greater, or the surface of the old masonry wall, or the bank, been smoother, this difficulty would not have occurred. As a matter of fact, as results proved, there were places where the ram was not required. In most of the work the guide was maintained at an angle of 45 degrees, but it could be adjusted to work nearer the vertical if required. The ram frame was made of timber, and the guide of 15-inch steel channels. The latter was carried in a gudgeon bearing attached to the inclined post support, which may be seen in plate B. The ram and box would drop by gravity, and were drawn back or controlled by a steel cable operated from the hoist.

The Plant in Operation—The entire plant was ready for work early in June, 1907. In April the canal was unwatered for a portion of the month and gangs of men put on to prepare the slope wall, on the south side, for the new facing. All the loose stones were removed and the toe of the wall made ready to receive the bottom of the mould. Photographs were taken of any sections presenting unusual irregularities, and all the necessary data provided as to the condition and slope of the bank.

Placing the Moulds—The first section was started on the south bank, a few hundred feet above the Cote St. Paul bridge, a location which, in so far as agitation of the water and limitation of working room were concerned, was the worst possible.

The moulds were floated opposite the site, raised up by the slings with the lifting derrick, and lowered down in front of the bank. The diver then descended and checked the distance from the wall to the mould, guided the rail-ballast to place, and saw the toe properly braced with large flat stones lowered down for that purpose. The top of the mould was placed in alignment by setting off the given distance from the base line. In some places the top of the bank or revetment wall was so badly washed that it was not possible to take a line from it. The top of the mould was secured to the bank by timber braces and cables to anchor blocks placed at convenient points.

Operating the ram—After the moulds were ready, the mixing scow was floated into place, the arm run out over the bank and moored at rest over the longitudinal beams arranged to slide it forward on, when the scow was moved.

Tests were now made in lowering and raising the ram, and, beyond the usual stiffness expected in new machinery, everything worked satisfactorily.

A few batches of concrete were next tried, and it was noticed, as the bucket was lowered, that the water which rushed in at the top caused no violent washing out of the cement. After a little experience in lowering the ram, no discoloration of the water appeared, which showed that the cement was not being washed away. The ram was run to the bottom, about 23 feet on the slope, and, as the concrete filled in below, it was found quite easy to judge the proper point at which to stop the ram. This operation was continued until the top was reached, and a section of about 20 feet, at bottom, was filled before the plant was moved forward. The scow was moved about every 8 or 10 feet as the work progressed. When the concrete reached to within 4 or 5 feet of the top of the wall it was found unnecessary to use the ram, and the concrete was allowed to flow into place from the open bucket.

(Concluded in next issue)

Use of Concrete in Pavement Construction

The Makeshifts Adopted before the Evolution of the Modern Pavement —Durability and Other Advantages of Concrete—Origin of Its Use

By Jas. Pearson, President Constructing and Paving Company, of Ontario, Ltd.

The first important step towards improvement in road making was the invention of John L. Macadam, who, in or about the year 1818, devised the road made of broken stone and still known by his name. So far as country roads are concerned, it is still the recognized standard all over the civilized world, and when well laid is a good one for country use, but when heavily travelled requires constant repair. Since the advent of the motor car the macadam road will be still more difficult to keep in good condition.

Although no change has been made up to the present time in the construction of the macadam road, this device did have something to do in the development or evolving of the ideal smooth surfaced pavement, with concrete foundation, of the present day, and this is how it occurred: In the district of Val de Travers, canton of Neuchatel, Switzerland, macadam roads were made of a broken brown bituminous limestone. Under the pulverizing effect of the traffic, and the influence of the sun, in softening the bitumen, the surface of the pavement became welded together in a continuous sheet, and in 1854 the first pavement of this material was laid in Paris, on Rue Bergere, and this is what is known as rock asphalt, now so extensively used throughout the cities of Europe. It is also known by the name of Val de Travers. It has also been used to some extent in some of our own Canadian seaport towns and at Ottawa, but the cost, in comparison with the use of Trinidad and other American asphalts, which have since come into competition, makes its further use in America prohibitive.

The success of this bituminous rock as a pavement led a French chemist named Edward de Smedt, to analyze it. He came to America in 1870, and among his experiments devised a practical paving material similar in effect to the Neuchatel bituminous rock but less expensive. De Smedt tried the use of a mixture of Trinidad asphalt with sand and laid [illegible] of pavement with it in several American cities to keep alive his patents. In 1877, on Pennsylvania avenue, in Washington, between the White House and the Capitol, outside of some samples referred to, was laid the first asphalt pavement in America. It took the place of an old [illegible] one which had supplanted a [illegible]. The history of street paving on this continent. First the earth road

tor yof street paving on this continent. First the earth road

or turnpike rounded up with a ditch at each side, then the [illegible]. Sometimes it [illegible], or as a foundation it was laid on a layer of split cedar logs. After this, came the wooden block, and when sawn in rectangular shape, laid on a tarred board foundation two layers of inch boards crossed, such as was the wooden block pavement laid in Toronto over thirty years ago on King street from Yonge to York. But our experience of wooden block pavements was mostly with the round cedar block cut from the log and laid on either tarred boards or on a bed of sand and gravel, mostly the latter, and a wretched experience it was.

There was also the cobblestone pavement—roughest of all, and where the cost could be borne, as it was expensive, stone block pavements of granite or sandstone were resorted to. Such were the devices and makeshifts adopted before the modern pavement was evolved.

Origin of the Use of Concrete

In experimenting it was found that asphalt, whether Val de Travers, Trinidad or any other, was only serviceable as a surfacing material. To make a pavement with it, a firm and rigid base or foundation was absolutely necessary. As a surfacing material, smooth, easily kept clean and repaired, sand and pulverized limestone mixed with sufficient asphalt to cement them together, made the nearest approach to the ideal pavement surface that had yet been hit upon, but it was absolutely useless without a rigid base to support it, so a cement concrete was tried and found to meet the requirements, and thus the use of concrete originated as an asphalt pavement base.

Noting the utility and success that attended concrete as a base or foundation for asphalt pavements, it has been adopted generally by civic engineers as a base for most other pavements, such as brick, vitrified block, asphalt block and even granite block is now laid on concrete, as experience proves that it gives and maintains a more even surface to any class of pavement.

As a base it has many advantages over any other foundation. On streets where the subsoil has been cut and disturbed by putting down sewers, water and gas pipes and making connections with buildings and where a settling is likely to take place, a good 5 or 6-inch concrete will maintain any ordinary traffic, even if unsupported at these cuts. Its use has also entirely supplanted the use of stone in curbs and gutters and with great economy as to cost, a stone curb and gutter that would cost about $1 per lineal foot can be laid for half that cost with cement, while the latter far excels the former in durability and appearance. Stone curbs made of straight blocks do not [illegible] with the [illegible] of a concrete construction on a winding street, nor will stone curbs remain in position no matter how well set, owing to the depth of the frost in our cold winters. The recognized construction of concrete curb and gutters now is to have them

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*Extracted from Paper read at the Annual Convention of the [illegible] Cement and Concrete Association.

constructed on the concrete base and at the same time. This saves material and forms one solid body consisting of base, curb and gutter. Sometimes when the sidewalk is constructed before the pavement and is placed out adjoining where the pavement is to be, the curb is built as a part of the walk and is then made of sufficient depth to form a curb to the bottom of the base of the intended pavement.

As a base for pavements, concrete has another advantage in that it can be laid on ground that is wet and even soft, as moisture only improves its quality, and, being a solid body, it will bear up the traffic even if there are weak spots underneath. Its use is now revolutionizing the construction of those parts of street pavements occupied by street car lines or tracks. Heretofore the rails have been almost entirely laid on wooden ties resting on the ground. With the modern large street car and heavy traffic, tracks so laid are continually sinking so that the rails have, at great expense and inconvenience to traffic, to be frequently shimmed up to keep the motors underneath clear of the pavement. But by the use of concrete under the ties or under the rails without ties, a rigid and permanent track can be had and the pavement between the rails kept even with that on the outside, thus giving the whole street an even and durable surface except as to the groove for the flange of the car wheels to run in.

Durability the Greatest Advantage

These are some of the advantages recognized in the use of concrete as a base for the modern pavements, but the greatest of all is its durability. It is permanent, so that when the wearing surface wears out, which in time all wearing surfaces will, it is still there as good as ever, ready for a new top—and thus it is in the end the most economical. In fact, so generally recognized has concrete become as the proper base for all the best pavements, that the proper definition for a permanent pavement as distinguished from others may be said to be a pavement having a concrete base. And right here I would tender some advice to the small towns that are raising funds for permanent pavements on their main streets, that no matter what surface they adopt, whether asphalt, asphalt block, brick or bituminous macadam, they should insist on a concrete base. In this they will then always have a valuable asset—a base that can be resurfaced from time to time after the first one wears out. It will prove to be the most economical in time.

With regard to the use of concrete as a wearing surface, while it is recognized as the most excellent material when properly made, for sidewalks, presenting a beautiful surface that wears evenly and is more durable than stone, except perhaps granite, yet it does not form a good wearing surface for a busy street with much vehicular traffic with iron tires. It has no resiliency and is too brittle, and when it wears uneven by reason of the constant beating of the iron tires and horses' shoes, it is difficult to repair. In fact, the quality of rigidity which makes it a perfect base militates against its use as a wearing surface. This conclusion is not mere theory for it has been tried as a wearing surface. About fifteen years ago a street in Utica, half a mile in length, was paved with it under the highfaluting name of Silica Byritic, but even the name did not save it from wearing into ruts and holes within two years. There is also a pavement of it on a short street in Toronto, laid about ten years ago, not a success. But it is now being adopted rather extensively for paving lanes and areas where there is little traffic.

If the time should come when increased travel by the rubber tired motor car should remand roads set apart for their exclusive use, a concrete pavement would, I believe, make the most ideal one.

In conclusion, I may add that the recently reduced cost of Portland cement in comparison with former years will add an additional incentive to the use of this most valuable material in the construction of modern pavements and the beautifying of our towns and cities.

Tapering Concrete Chimneys

The majority of the numerous reinforced concrete chimneys that have been built are cylindrical in shape, due to limitations in the design of the forms, and where a variation in diameter is made this has been effected by an offset, says the Engineering News. Recently, however, some special designs of form construction have been devised which permit the building of tapering stacks without excessive cast for this feature of the work. The forms, which are 5 feet high, consist of sets of rings, steel plates forming the surfaces, and long bolts by means of which the adjustments of diameter and wall thickness are made. The rings are of sufficient diameter to enclose the base of the chimney, and are made of heavy angles bent to varying radii and spliced into complete circles. The radial bolts must be long enough to permit of their extending into the chimney surface when the diameter is smallest (at the top of the chimney). The diameter of the rings remains constant, standard sets of form rings being carried in stock for various sizes of chimneys. The steel sheets are of standard size, and are filled out with split sheets, made interchangeable. The sheets are secured by flathead stove bolts to vertical stiffeners on the outer surfaces of the forms, except at one rib, where the adjustment is taken up. The varying diameter is obtained by means of the long radial bolts which turn through small angles attached to the steel rings, and end in malleable clips which grip steel bands on the outside of kerfed wood strips which press the sheets in to the desired radius. Permanent centers are kept at the base of the chimney and on the scaffold above, and each section of the chimney is plumbed. Thus perfect alignment is secured throughout the construction.

Blistering and Peeling of Paint

One of the complaints occasionally made in connection with the painting of frame houses is that the paint blisters and peels from the outside of the building, in some cases peeling clear to the wood. This is attributed in a measure to bad priming and painting when the wood is green or damp, and much of it is doubtless due to this fact. Boiled or fatty oil has no place in a priming paint for wood, nor should a priming be stout. There is nothing better than pure lead and well settled, but not fatty, raw linseed oil, mixed fairly thin and without dryers for new work, and such prime should be rubbed well into the dry wood. Over such a priming paint is not likely to blister or peel, unless there are some local defects in the surface or behind it, such as plastering in damp weather, or leaky gutters on the roof.

In repainting old exterior surfaces the painter should, as an act of precaution, assure himself before he undertakes the work of the actual condition of the old paint, which may appear to be solid and intact all over, and yet, where the new paint has been applied over it for six months or a year, may loosen its hold, taking the new paint with it and coming off in large blotches. A tap on the old paint here and there will tell whether it is adhesive and solid, or whether it is loose. The new paint cannot penetrate through the old paint and fasten it to the surface; on the contrary, when contracting as it dries, it is liable to draw away still further from the wood, especially if the priming has been defective. It is advisable to remove all of the old paint, either by burning or scraping.

In deciding upon the amount of paint required for a given surface, the makers of paints usually advise two coats of ready mixed paint for 200 square feet of surface to the gallon. This is only approximately correct, however, because much depends on the character of the surface to be treated, and the consistency of the paint to be used. Some paints will go much farther than others. It is estimated by some experts that 18 pounds of white lead will be required to make paint to cover 200 square feet of surface. This would indicate 18 pounds of lead to a gallon of paint.

An Analysis of Concrete Bridge Failures

Typical Cases Exemplifying Common Errors—Defective Design, Lack of Care in Preparation of Concrete, Insecure Foundations and other Sources of Trouble

By C. R. Young, of Messrs. Barber & Young, Bridge and Structural Engineers, Toronto*

In order to ascertain the ground, if any, on which the representations of the opponents of concrete bridges are based, the writer has looked into the cases of concrete bridge failures of which he could obtain reliable information pointing to the cause of failure. The number of these cases is necessarily small, for, although many failures have taken place in the years that concrete has been in use as a material for bridge construction, it is difficult, for obvious reasons, to obtain information for publication concerning such. However, through the kindness of several engineers, it has been possible to supplement to some extent the data obtainable from published records and personal observation, although from the nature of the subject, the location of the bridges and the names of those who might in any way appear to be responsible are withheld, except in certain cases where such information has already appeared in the technical press. The former cases are therefore designated by number only.

The data thus collected are presented below in as concise a form as possible consistent with a full statement of the circumstances in any way likely to aid in placing the responsibility. Some attention is given to cases of pronounced cracking of spandrel and wing walls, since such developments, while not incapacitating the bridge for present traffic, constitute failure to the extent of impairing the bridge aesthetically, if not materially shortening its life. From this evidence the cause of failure (complete or partial) is deduced in each case and a summing up of the cases is presented at the close of the paper.

Case 1.—Reinforced concrete slab or flat-top bridge of 10 ft. span, intended to carry a fill of thirteen feet above the top of the slab; slab, 12 inches thick, reinforced by longitudinal rods ¾ inch in diameter spaced 12 inches centre to centre, and transverse rods of the same size, 2 feet centre to centre; spandrel walls, 2 feet thick at the bottom, reinforced by vertical ¾ in round ros, 2 feet centre to centre.

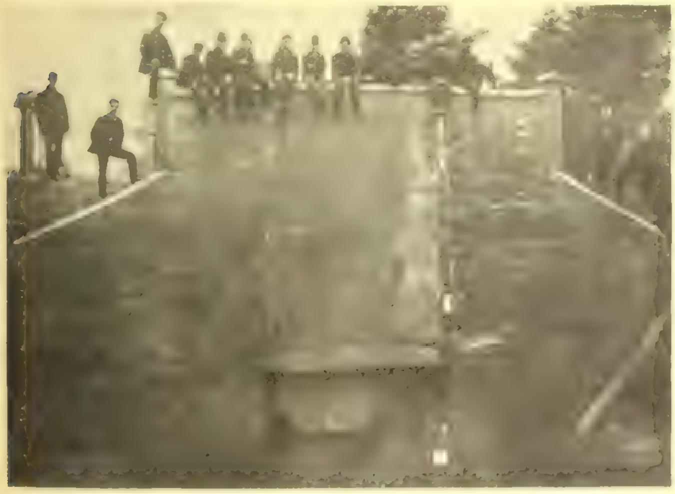

Fig. 1, Case 1.

After the concreting had been completed [illegible] and some 10 feet of the earth fill had been placed the centres were struck, with the result that almost immediately the slab collapsed under the weight of the fill alone, leaving the spandrel and wing walls intact, as shown in Fig. 1.

An examination of the wrecked structure at once directed suspicion to the design rather than to the materials or workmanship. The concrete was apparently of correct proportions, had set satisfactorily, and had evidently been placed with care. Computations based upon measurements of the slab taken after the failure showed a fibre stress of 41,500 pounds per sq. in. in the steel and 1,100 pounds per sq. in. in the concrete under a 10 ft. fill. Apparently, no special care had been taken to properly anchor the longitudinal reinforcing rods, so that under this stress, considerably in excess of their elastic limit, they had pulled through the concrete, as was evidenced by the polished state of the concrete in contact with these rods. The failure can therefore be wholly attributed to a defective design.

Fig. 2, Case 4.

Case 2.—This structure, which is typical of a number of reinforced-concrete girder bridges completed in a county in the State of Indiana some three and a half years ago, was of span 15 feet in the clear and 16 feet clear roadway. Two longitudinal girders 15 ft. 10 in. centre to centre carrying a seven inch slab comprised the superstructure. Upon this slab was placed a 12 inch earth fill and in addition it was supposed to carry a uniformerly distributed load of 200 lbs. per sq. ft. or a 20 ton road roller. The slab was reinforced by transwerse of a sectional area of 0.78 sq. ins. each, one inch from the bottom and 10 inches centre to centre and by longtudinal rods ½ inch in diameter and about 3 feet centres.

Before the striking of the centres, Mr. Daniel B. Luten, President of the National Bridge Company, in a communication to the Engineering News, pointed out the weakness of the design and questioned its safety. He showed that under dead load alone the compresion in the concrete of the slab would be about 1,000 pds. per sq. in., while for the specified live load consisting of a 20 ton roller these figures became 3000 and 55,000 pds. per sq. in. respectively.

Before Mr. Luten's letter had appeared in the journal mentioned, startling confirmation of his deductions was given by the collapse of the bridge under a traction engine the day following the removal of centres. From the testimony of the engineer in charge of the engine, the bridge gave way when the rear wheels were about in the centre of the span and indications pointed to the slab as the initial source of failure. Careful examination of the wreck disclosed no broken rods and failure was apparently caused by excessive compression in the concrete of the slab. Under the loading of the traction engine which weighed about [illegible] lbs. and of which 9000 lbs. were concentrated in the rear axle, the compression could not have been less than [illegible] lbs. per sq. in. with the tension in the steel about [illegible] lbs. per sq. in. The corresponding stresses in the girders were about [illegible] lbs. per sq. in. for the concrete and 20,000 lbs. per sq. in. for the steel. The compression in the centre of the slab was therefore, nearly equal to the ultimate strength of a good concrete one month old, and in excess of the strength of the material used, which appears to have been of poor quality, on account of the presence of "dirt" in the sand. Very bad design and lack of care in preparation in the concrete, were, therefore, clearly responsible for the collapse.

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* Extracted from Paper read at the 2nd Annual Convention of the Canadian Cement and Concrete Association at London, Ont., [illegible]

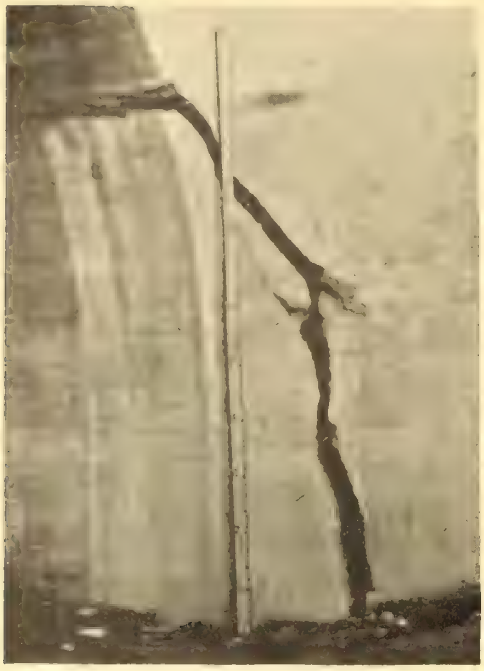


Fig. 3, Case 4.

Case 3.—Reference has been made to a number of girder bridges similar in design to that of Case 2, constructed during the same year as the latter, in the State of Indiana. One of these of 24 ft. span developed a bad crack in one of the beams shortly after the striking of the centres; but, managed to hang together and carry the traffic for about a year and a half. There was no load on the bridge when it finally fell and no evidence could be discovered of any weakening or undermining action from floods or other causes. It, therefore, appears that its downfall, like that of its companion in disaster, was due to the errors of an inexperienced or careless designer.

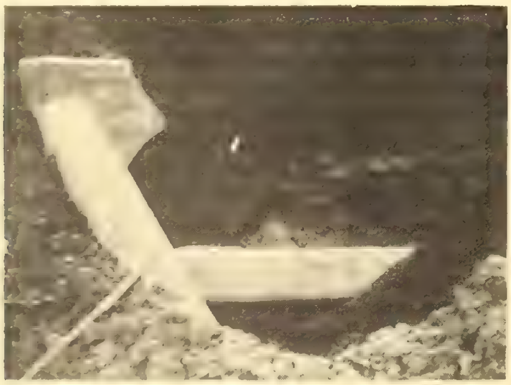


Fig. 4, Case 5.

Case 4.—Plain concrete railroad culvert of 20 ft. span and 10 ft. rise, carrying a fill of about 10 feet over the crown; crown thickness 18 inches; foundations were carried about 4 or 5 feet below the natural level of the ground. The situation of the bridge was on marshy soil and the foundation bed was of soft clay with considerable organic matter present, but no piles whatever were used.

As the filling was placed on the arch, cracks began to develope, in the case of the west wall, passing vertically up the wing walls near their junction with the spandrels, then crossing this corner and trending to the crown of the arch, reaching it at about one-quarter of the length of the barrel in from the face of the spandrel walls (Figures 2 and 3). In the east wall a large vertical crack passed from the footing up the soffit to near the crown where it joined a large horizontal crack running along nearly the whole length of the arch barrel. In addition to these very prominent cracks many other tributary cracks of lesser extent developed.

Careful examination of the cracks in conjunction with the originally level mould board lines conclusively showed that the abutments had settled from 4 to 6 inches under the heavy load of the fill, and that the insecure foundations were wholly responsible for the failure.

The writer is indebted for the above information to Mr. F. L. Somerville, M. Can. Soc. C.E., under whose observation this failure came, but who was in no way responsible for the design or construction of the bridge.

Case 5.—A plain concrete railroad culvert 10 feet in span carrying an embankment 52 feet in depth, was constructed in the winter. The foundation bed was of soft clay and no piles were used. In the following spring when the frost came out, a portion of the barrel near the middle collapsed under the weight of the fill and a part of one end with one of the wing walls gave way under the sliding of the embankment, as shown in figure 4.

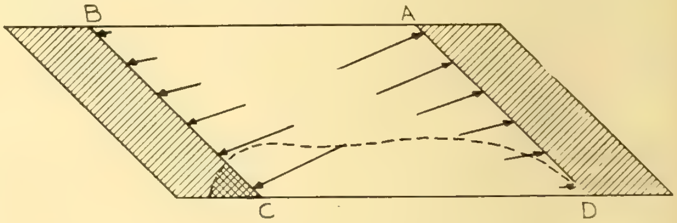


Fig. 5, Case 7.

The explanation offered for this failure, and one that appears reasonable, was that the spring thaw had destroyed the even bearing of the culvert on the foundation-bed and that the barrel had thus been resolved into a beam at several points, the wrecked end portion acting as a cantilever. Had reinforcement been used, which is particularly desirable in winter work of this class, the structure would no doubt have safely withstood the adjustment.

Case 6.—A reinforced, concrete arch highway bridge of about ing directly upon a quicksand bed and in a situation involving the excavation of a new channel for the stream. Shortly after the striking of the centres the arch ring collapsed, although subsequent computation showed the design to be sufficient.

While the early removal of the forms may have been to a small extent responsible for the failure, the excavation for the new channel appears to have immediately precipitated the fall. Under the considerable weight of the arch, and favored by the removal of material between the abutments, lateral flowing of the quicksand with attendant settlement and tilting of the abutments naturally followed. Had the foundation bed been piled, this development could not have taken place. Faulty design of foundations was, therefore, primarily responsible for the failure; but, unless some of the piles had been driven on a batter, bad cracking of the spandrels would have occurred under the conditions named.

Case 7.—Some seven years ago a Monier arch of considerable size, and built at an extreme skew, collapsed at Bendigo, Australia, with loss of life. The failure was sudden and unattended by any premonitory signs of distress, unlike the recorded char-

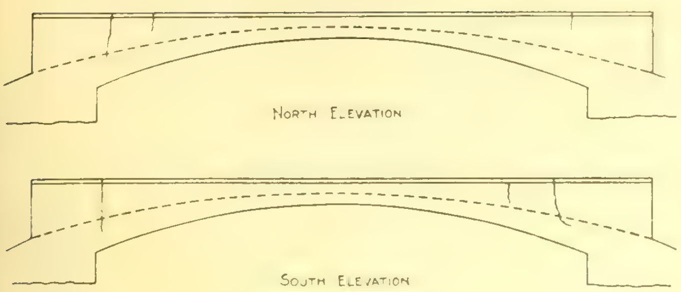


Fig. 6 Case 10.

acter of failure of Monier arches, which had been tested to destruction in Europe and elsewhere. In view of tht fact that the abutments were especially massive and securely founded on solid rock and that the materials were excellent, the contractor attributed the disaster to incorrectness in the received theory of skew arches, and retained the services of the late Professor W. C. Kernot, of the University of Melbourne, to conduct a thorough investigation and report upon the cause of failure.

By means of measurements of the deformation of loaded India rubber models and by ingenious electrical experiments on a metallic model, corroborated by mathematical calculations, Professor Kernot was able to show that Rankine's theory of the skew arch, which had up to that time been universally accepted, was altogether erroneous. Rankine's view, as stated in his "Applied Mechanics" was that "the forces which act in a vertical layer or rib of a skew arch with its abutments, are the same with those which act in an equally thick vertical layer of a symmetrical arch with its abutments, of the same dimensions and figure, and similarly and equally loaded." It followed from this assumption, therefore, that the design of a skew arch in no way differed from the design of a right rach of the same span as the span of the former measured parallel to the longitudinal axis of the bridge. Professor Kernot, however, conclusively demonstrated that there is a great intensification of stress along the short diagonal AC of a skew arch (as indicated by the arrows in Fig. 5), the actual stress being almost exactly double the stress along lines parallel to AB. At the same time the stress along the long diagonal BD was excessively small.

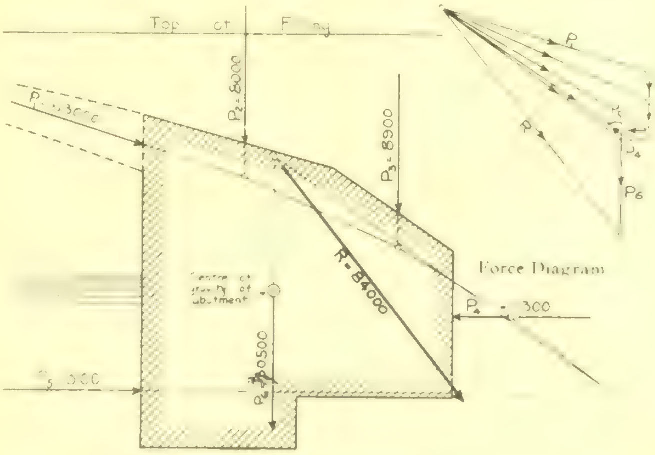
The existence of such a stress condition is particularly serious since the acute angles of the abutments are of insufficient mass to properly resist the augmented thrust in the direction of the short diagonal, and if the skew be large, the factor of safety low or the test load unusually heavy, the abutments may give way at these points. This is precisely what happened at Bendigo, for the acute angle C of one of the abutments was literally pulverized over the double-hatched portion by the local intensification of the stress, and the part of the arch enclosed by the irregular dotted line and the line CD had consequently fallen.

Fig. 7, Case 10.

The cause of this failure lies unquestionably in the lack of knowledge at that time of the true principles of proportioning skew arches and their abutments.

Case 8.—The most recent concrete bridge failure of magnitude occurred on February 28th, 1910, when a reinforced concrete arch highway bridge of three spans over the Flat Rock River near Edinburg, Ind., collapsed during a flood of exceptional height. The bridge had been open to traffic for about eight months, and during that time had stood one severe flood accompanied by an ice jam.

As designed, the structure consisted of one central span of 90 feet and two side spans of 75 feet each, all foundations to be on piles. Although the design was submitted by a well-known and responsible concrete bridge company, the County Commissioners decided with the wisdom born of inexperience, to save money by omitting the piling and carrying the piers and abutments down to a somewhat greater depth than originally contemplated. Beyond furnishing the design, which appears to have been entirely satisfactory, with the possible exception of insufficient provision for flood waters, the bridge company had nothing to do with the work, and the County Commissioners for whom the bridge was built had no engineer to advise them or supervise the construction. In spite of this, and to the credit of the contractor, the materials and workmanship were of excellent quality, many of the particles of stone and gravel of the concrete having split instead of being torn out of their places by the collapse.



Section of Abutment

Fig. 8, Case 10.

Upon careful examination of the wreck by a member of the editorial staff of Engineering News, it was found that the scour actuated by a considerable quantity of lodged drift had undermined the upstream end and one side of one pier, causing it to tip forward and endwise, and resulting in the fall of the two arches which it carried. The other pier being thus left without support to counteract the thrust of the remaining arch, likewise tilted, allowing this span to drop vertically into the river. There was no evidence to point to any other cause of failure than [illegible] foundations, and the responsibility for this rests with those who altered the original plans and specifications.

Case 9.—The most extensive failure of reinforced concrete bridge construction of which records are available, is that of the City Bridge across the Illinois River at Peoria, Ill. On May 1, [illegible] three spans had [illegible] of a reinforced concrete [illegible] which had been opened to traffic only a few weeks [illegible] before the supporting centres had been struck. The [illegible] with Melan arches [illegible] feet in the clear, at fifty feet rise and of the solid spandrel type. Practically all of the earth filling was in place at the time of failure. The two ruined piers were specified to be founded upon piles driven to bedrock, though subsequent investigation showed that probably most of the piles stopped at less stable material. In addition, the piles were to be enclosed by permanent water-tight tongue-and groove sheet-piling or Wakefield piling to safeguard the pier foundation against scour; but, in spite of repeated warnings on the part of the consulting engineers, this was not done, nor was any protection in the way of riprapping provided by those directly in charge. As a result, during the high water of the spring of 1908, the scour was most serious, in the case of one pier reaching to 3.8 feet below the base of the pier, or 11 feet below the original bed of the river.

Since the design and construction of the superstructure was apparently entirely satisfactory, it was, therefore, not difficult to assign the cause of failure. The lateral support and the frictional resistance of the piles under the two piers in question having been largely removed by the excessive scouring action of the water, buckling and considerable settlement would naturally follow. This action was no doubt largely precipitated by a serious settlement and movement in a shoreward direction of one of the abutments, which began a year prior to the collapse of the structure.

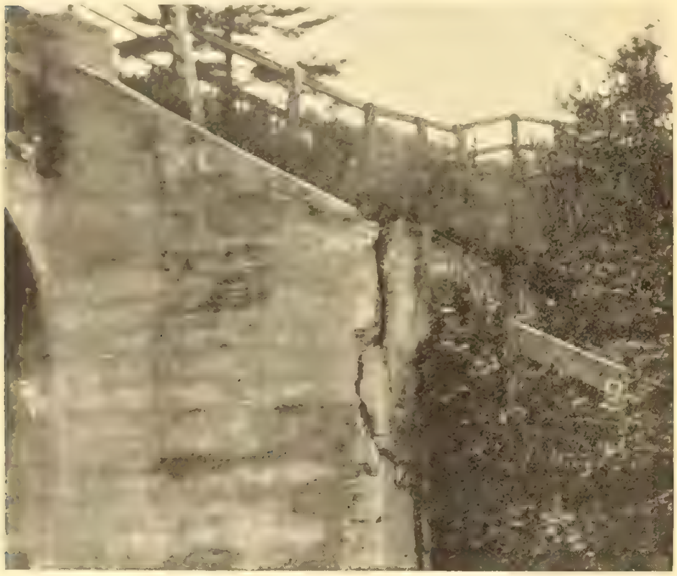


Fig. 9, Case 11.

Under such circumstances, there is little doubt that the cause of failure was insecurity of foundations.

Case 10.—This is not a case of total or even partial collapse, for the bridge in question has been in constant service since its completion some two years ago. It affords, however, an excellent example of spandrel wall cracking, and as such will be used to illustrate a general discussion of this defect, which, as has already been stated, constitutes failure to a limited degree.

This bridge, having a span of 60 feet in the clear, a rise of 6 feet and a crown thickness of 15 inches, developed pronounced cracks in the spandrel walls, as shown in Fig. 6, immediately upon the striking of the centres, although the spandrels are reinforced in the region of the springings by three longitudinal ¾-inch round rods. One of these rods is in the coping, and the others are located at distances of 1 and 3 feet below it. Each of the abutments rests upon a large number of vertical piles driven into quicksand.

The conspicuous character of the cracks is evident from Fig. 7, giving a photographic view of one of them in the south-east spandrel wall. In this case the crack passes well into the ring, although not as far as the one in the southwest spandrel, which reaches practically to the centre of the ring, as shown in Fig. 6.

With the object of explaining the existence of these cracks in spite of the longitudinal reinforcement in the spandrels, the writer obtained information concerning the dimensions of the abutments and constructed the diagram shown in Fig. 8. In this diagram the various forces acting upon the east abutment are shown in magnitude, direction, sense and point of application for a vertical longitudinal rib or strip, 1 foot in thickness. The thrust of the arch P_1 is given for the weight of the arch ring and filling only, since the spandrel cracking occurred without any live load on the span. P_2 and P_3 are the weights of the two trapezoidal prisms of filling resting on the abutment; P_4 represents the lateral pressure of the earth filling acting on the vertical projection of the abutments and tending to force it forward into the stream; P_5 is the pressure of the water and the saturated material of the stream bed, acting on the face of the abutment; and P_6 is the weight of a strip of abutment one foot thick reduced for buoyancy of the submerged portion. These various forces, when combined, produce a resultant action, R, on the base of the abutment having a magnitude of 84,000 pounds and passing altogether outside of the base instead of cutting it near the centre as it should in a properly designed abutment.

With the aid of Fig. 8, the spandrel cracks in this arch are therefore not difficult to explain. If the abutment were merely a simple block of masonry acted upon by the forces indicated in the diagram with no others operating, it would overturn about the lower right-hand corner; but, the presence of the spandrel walls with their reinforcement supplies sufficient resisting moment to preserve equilibrium, although not without overstressing them and causing the very pronounced cracks indicated.

Apart from the obvious effect of this serious error in the design, it is probable that spandrel cracks would have still occurred, although not to the same extent, as shown in Fig. 6. The abutments, as has been noted, were founded on certical piles driven into quicksand, and under the thrust of the unusually flat arch lateral yielding of the piles would in all probability have been followed by cracking of the spandrels. The practice of founding arch abutments on piles, none of which are driven on a batter, or where no abutment ties are employed, is in the majority of cases likely to result in unsightly or dangerous cracks.

Spandrel cracks are so often found in concrete arches that their presence cannot always be attributed to badly designed abutments or to yielding foundations. The writer knows of one case where spandrel cracking occurred in an arch the abutments of which were founded upon solid rock and where, it is believed, the design was in general satisfactory. The spandrels, however, contained no longitudinal reinforcement, and the settlement of the crown when the centres were struck, had induced sufficient negative bending moment in the spandrels near their junction with the abutments to overcome the tensile strength of the concrete and cause conspicuous cracking. In all probability no such development would have taken place if the spandrel walls had been well reinforced, certainly not with properly designed arch ring and abutments.

The objectionable practice of inserting gas pipe or other metallic hand-rail posts in the spandrels of arches, strongly favors the development of spandrel cracks. Since the temperature of the exposed metal rises more rapidly than that of the concrete under the heat of the sun's rays, the posts expand more rapidly than the concrete and cause cracking of the latter at every post, which apparently increases with time on account of the swelling action of the rust at the surface of the spandrel wall.

Case 11.—The badly cracked wing wall shown in Fig. 9 is typical of a great number of like cases which exist throughout the country. Such a development does not, of course, put the bridge out of commission; but it necessitates the expense of shoring and repairs and at the same time provides a never-failing stimulus for remarks uncomplimentary to engineers. The source of the trouble is generally in bad design, and sometimes in careless workmanship. In this case the wing wall is about 24 feet high, 3 feet thick at the base and 18 inches at the top, with no reinforcement whatever. The workmanship and materials were good, and the failure is therefore entirely due to the absurd proportions of the wall. A number of cases of cracking of correctly designed wing walls at their junction with abutments are known to the writer, where trouble might have been avoided by a small amount of horizontal reinforcement at the corners.

Conclusion.

Summing up the eleven cases cited, the principal, and therefore primary, causes of failure are found to be as follows:—

Causes of Failure.	No. of Cases.
1. Design of foundations originally defective or rendered defective by alterations not approved by the designing engineers	6
2. Design of superstructure defective	5
Total	11

It therefore appears that in the cases discussed over one-half of the failures occurred from defective design of foundations. Especially significant is the fact that in the case of the two most extensive failures described, the original designs and specifications for the foundations were satisfactory, and that the disastrous results were caused by alterations in the plans made by persons in authority without professional advice. The time is coming when engineers in self-protection will refuse to allow their plans and specifications to go out and suffer interpretation and alteration by laymen, but will insist upon the same expert attention to the work under construction as in the designer's office.

A feature of the above tabular statement which may occasion some surprise is the fact that in all of the cases considered, failure was primarily due to errors in design, either of sub-structure or superstructure, and that the material, except to a limited degree in Case 2, was not in any way responsible for the unfortunate results.

It is perhaps unnecessary to remark that no special selection of cases was made for the purpose of this paper, but every case has been included concerning which reliable data could be obtained in a short space of time. Since these cases are probably typical of most of the failures of concrete bridges, there does not appear to be any ground for the disquieting statements which have been made by interests antagonistic to concrete with the object of discouraging the use of the material in engineering works. On the contrary, the successful employment of concrete in thousands of bridges during the past 15 or 20 years amply justifies the belief that structures of this material, when properly designed and constructed, are at least as permanent as those of stone masonry.

Reinforced Concrete vs. Steel for Short Span Bridges

The American Railway and Maintenance of Way Association has issued Bulletin No. 117, containing the report of the Committee on Iron and Steel Structures, in which appears the following abstract:

In any bridge the qualities to be desired are: adequate strength, freedom from vibration and excessive deflection, economy in first cost economy in maintenance, and permanence.

The theory of flexure of reinforced concrete is sufficiently well understood to enable safe and economical designs to be made of this material, and experience with reinforced concrete structures carrying dead loads only has been abundant. Experience with such structures carrying heavy live loads and subjected to the shock and vibration of [illegible] at high speed, has not been so extensive, but reinforced concrete girders can be designed and built in short spans of any strength required, or likely to be required, by railway loads. In the event of overloading or defective construction, reinforced concrete will give quite as much warning of probable failure as other materials.

One of the chief advantages of reinforced concrete over steel for short spans is that the form lends itself more readily to ballast floor construction, the superiority of which to open decks is evident to every operating officer, not only on account of the absence of wood, which may rot or burn, or exposed steel, which requires protection from brine drippings or other corrosive influences, but also on account of the freedom from vibration and excessive deflection and the reduction of the cost of maintenance to a minimum.

The comparative economy of the two styles of construction is a matter which is not easily determined in general terms, depending as it does upon the market price of steel, concrete materiels and labor. The character of the design is also a factor of first importance. Generally, speaking, if it is not considered advisable to use ballasted floors in a particular case for that case the short span of I beams with ordinary floor of wooden ties is the cheaper construction in first cost. If, however, a large number of similar spans are to be built, so that concrete slabs can be constructed in a central and conveniently arranged plant, and if the erected price of steel work approximates three (3) cents per pound, the difference between concrete slab construction built with ballast floor and steel construction with open wooden floor, will be small, and in many cases will be favorable to the concrete.

If the designs contemplate the use of I beams embedded in concrete, compared with reinforced concrete girders, economy will be all on the side of the latter.

Short spans of reinforced concrete also permit a substantial economy in the design of abutments carrying them.

It is the opinion of your committee that reinforced concrete flat slabs or girders are not generally advisable for railway loads in spans exceeding 40 feet, but, as the great majority of structures carrying tracks over openings in the roadway are of spans less than 40 feet, the importance of these small structures is very great, and we believe the use of reinforced concrete for these small spans is desirable.

Long-Span Concrete Bridges

Long-span concrete bridges are receiving attention so extensively that there can be no question about the firm position this type of structure now holds in engineering practice. In this country we have only recently completed the 233-foot Walnut Lane span in Philadelphia, and the Rocky River Bridge of 280-foot clear span is now under construction at Cleveland. A bridge having a central span of 281 feet has been designed by the city engineer of Spokane to carry Monroe Street across the Spokane River. A span of 285 feet has been adopted to carry the New York barge canal over a gorge in the vicinity of Medina, N.Y. The 710-foot span of the proposed Henry Hudson Memorial Bridge at New York City has been the subject of so much discussion that it is at once recalled when the design of long-span concrete structures is mentioned. This bridge, however, is apparently not likely to be constructed for some time, owing to the action of the city authorities in withholding further appropriations for the engineering work. With the exception of the Henry Hudson bridge, the longest span yet proposed is that of a bridge recently placed under contract by the civic authorities of Rome. This will cross the Tiber with a span of 328 feet, having a rise of 1 in 10 and carrying a roadway 65.6 feet wide. The cost of this bridge has been estimated at £50,000. A bridge comparable with it in every respect is now more than half finished at Auckland, New Zealand. It has a total length of [illegible] and its main feature is a span of [illegible] feet, which will carry [illegible] roadway at an elevation of [illegible] feet above the ground.—Engineering Record.

Mr. J. P. Keep, testing engineer in the department of City Engineer Macallum, of Hamilton, is resigning his position and will leave shortly for California.

Modern Cement and Concrete Construction

Ruling Characteristics of Cement as now Manufactured—Controlling and Limiting Features During Construction—Suggestions for the Future*

By Cecil B. Smith, of Messrs. Smith, Kerry Chace, Consulting Engineers, Toronto

Cement is essentially a human product, and therefore imperfect. What is very important and noticeable is that it is varying year by year in its characteristics, moulded at times by true skill and science, or through the demands, often mistaken, of those who use it or control the use of the material.

At present it is considered in America that a cement manufactured from ground quarry rock of certain *average* ingredients, blended with a second material to give correct chemical proportions, is the cheapest product, and is quite satisfactory not only to the trade, but to the skilled engineer and scientist. This is a grave question, however; the highly limed, highly burned, finely ground clinker gives a cement which, when deadened by gypsum, will prove by all the gods (laboratories) fit to meet the specific tests now prescribed, but high tensile strength at one week proves nothing, except that the product matures early. The writer is painfully aware of the present tendencies. The engineer thinks he is leading, but he is being pushed along by the manufacturers into desperate courses, in a vain attempt to control the product to his satisfaction. The writer has been testing and using various cements in large quantities for 25 years, and also spent five years studying the characteristics of cement, and he is far from satisfied with present methods and usage.

Methods of Testing and Using Cement

Boiling tests, at best, are irrational, arbitrary and inconclusive, and are not safe grounds for absolute rejection. Hot water tests are less severe, but of the same inconclusive order. The only just and safe method, apparently, is to wait a month and observe the action of natural conditions. Cement is shipped too green, used too soon, and not given a fair chance, so keen is present-day commercialism. To be specific, gypsum dosing to regulate the time of setting and to disguise the presence of free lime is too prevalent, and early shipments of cement still containing free alumina, hot and variable in nature, are not uncommon practice. Upon the cement arriving at the works there is often no time to wait, and either without tests or only with hurried ones, the cement is put into service, if the sieving, boiling, specific gravity and one-week tests are acceptable, but after-results prove that in many cases the mortar in six months' time will show brittleness and unsoundness, and will in due course disintegrate. The view is here expressed that present specifications demand too much strength at early tests, but not enough by way of uniformity, soundness and ultimate toughness, and it would be well to consider the advisability of adopting the British custom of airing the cement before use, which may be done by the user, or more rationally and economically by the manufacturer. By suitable arrangements the cement might be thoroughly aired and cooled, and the customer could well afford to pay the extra price for a cement proven to have been properly aged and aired before shipment. By such methods less gypsum would be used and a sound product assured. Again, something further is wanted in the way of being able to secure a cement at a certain time of the year, and for a certain use, which has a certain time of setting to suit the circumstances. The Canada Cement Co., having control of so many mills and having a highly skilled organization, can effect this, and I trust they will do so when it becomes evident that variation in the time of set is a marketable quality.

We all read, year by year, the text-book views and ordinary specifications as to aggregates, and, no doubt, sound knowledge on this important question is becoming more widespread, but it must be clearly kept in mind that laboratory sand and pit sand are different products.

Laboratory tests are comparative, relative and protective only, but practice demands that the sand, gravel or broken stone most convenient, or cheapest, be made us of, if possible, and it becomes necessary for a practical man to size up the local situation and take action.

Speaking generally, a run of crushed rock is suitable for heavy concrete masses unless exceptional strength is required, but care must be taken that the design of storage bins is such as to prevent a separation of the larger pieces, which, rolling towards the outlet, will give a variable product. To determine the proper proportion of sand for the concrete, the average percentage of voids in the crushed rock should be determined and a slight excess of sand used, say 10%. If the rock used is sound, limestone, granite or trap, the finer particles from the crusher represent some of the required sand, but in some cases, the amount of dust produced, necessitates screening.

The writer is not in favor of the use of sand rolls to make artificial sand, as the result from the grinding of most rocks is a mixture of dust and slivers, and the concrete therefrom weak, variable and sloppy. The constitution of gravel may make it an ideal material for straight concrete, but in most cases the variation is so great as to warrant screening and reproportioning; however, a well made gravel concrete is usually heavier than a rock concrete, although not usually as strong. The variations in quality of sand makes it a difficult subject to discuss.

Everyone knows what a good sand should be, namely, of blended sizes, angular grained, clean quartz, and, for concrete, rather coarse, so as to economize in the use of cement. But usually one must accept an article only approximating the ideal and a fine, round-grained sand, with some clay or loam, must often be made the best of. Of course, if it is too poor it must be washed, but the usual course is to select the best available, and add more or less cement as may, in the user's judgment, be required to properly coat the particles, for which again a determination of the voids in the sand is advisable and a 10% excess of cement used.

Once the concrete ingredients have been determined upon, we come again to the question of human agency. The writer remembers well in building a large undertaking that some months after the concrete had been laid, a soft spot was found, and, upon careful investigation, it was determined that a mass of about 20 cubic feet had absolutely no cement in it. It was carefully dug out from the side of the wall and good concrete packed into the hole. It was evident that the inspector and men at the mechanical mixer had failed to put in any cement.

In practice, a suitable arrangement is to have a young student at the mixer to watch the assembly of materials and mixing, and a veteran builder at the wall to supervise the placing of the mixtures, but even with ample inspection, the human equation must be reckoned with.

It would not be suitable in this discussion to rehearse in detail the ordinary routine of mixing and placing cements. We all realize the numerous sources of error, and the necessity for constant and intelligent supervision. It is proposed rather to discuss certain special features and incidents arising from a rather varied experience.

Character of Foundation

Assuming that the concrete is properly constituted and placed, undoubtedly the most essential feature is the character of the foundation, for whilst concrete, owing to its monolithic nature, will span over small deficiencies in foundation, yet the limit is quickly reached: if, for instance, the structure is a large arched waterway, under railway embankments, this feature becomes vital. The writer has vividly before him disasters arising from upward pressure, between the two main walls, causing a complete wrecking of the structure. To meet this, future structures were placed on piling and heavy reinforcement added. Again, disaster, less severe than formerly, but still serious, occurred, and it was the evident deduction from these experiences that the only method of meeting the condition of deep and unstable clay foundations is to build an arched waterway, having a heavy superimposed load, with an inverted arch to completely meet the upward thrusts, and this has been found satisfactory. Another feature of design, often serious, is the special strains coming on the headwalls and wings of such structures. From the use of many types and after several disasters, the writer is of the opinion that when dealing with unstable materials, no amount of reinforcement or mass will fully meet the terrific stresses applied by sliding embankments. The only safe design is to carry the barrel of the arch forward and omit parapet and wings entirely. These remarks do not apply when ordinary dry materials are placed by teams or wagons, but to train-filled embankments made from unstable materials. In a recent train-filling experience, the whole valley was liable to be distorted by the superimposed loads placed on the clay bottom, and the chief engineer successfully prevented local distortion by a very heavy treatment of cross-logging placed in the embankment after it was partly made. This saved the arched culvert from destruction. The writer also calls attention to the undue burden placed on concrete abutments by attempting to shorten the spans. It is impressed on him that the proper course to pursue, where the nature of the filling or foundation is in doubt, is to lengthen the spans and reduce the abutments to mere bridge seats. The equilibrium of the hillside will then be preserved.

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*Extracted from paper read at the Second Annual Convention of the Canadian Cement and Concrete Association.

Cold Weather Work

The placing of concrete in cold weather is a much discussed subject, but it has no real limits, except expense. To be specific, the writer has placed concrete river piers in February, with temperature 20 degrees to 40 degrees below zero, with perfect and economical results, as follows: Hot sand, stone and water—no salt—and the structure protected during construction by a large tent in which a stove maintained a reasonable temperature when aided by the heat of chemical action during the process of setting. Again, the concrete has been placed at Point du Bois, Winnipeg River, all the winter under a huge shed warmed by stoves. The sand is in a large mass, and is heated by a buried steam pipe freely flowing. The economy and results are quite satisfactory. On the other hand, the writer cannot advocate the placing of small masses without adequate protection, or the placing in cold water in small batches. The chances are that the setting action will be suspended. The writer knows of several instances where concrete placed both under the water and in open air in cold weather in even large masses has not set until the next May or June. The criterion is to provide enough warmth for a long enough period and to conduct the work continuously. Once the crystallization has commenced, the danger is passed.

In the construction of walls required for water tightness and for decent finish, the method found most satisfactory is to place a continuous mortar facing, 3 to 4 inches thick, of 1 to 1 mortar, simultaneously with the placing of the mass concrete. This is not a difficult process when systematized, and is the only proper method of obtaining certain and perfect results, as any attempt at spading back the stone from the face of the wall is never perfectly done, and is a poor substitute at best for the facing method. To obtain a smooth finish, of course, we should use [illegible] but the addition of soft soap, [illegible] better results than oil, and is not [illegible] When the walls are built in the summer season, there is a danger of surface cracking, even if the forms are left in to protect the wall from the sun's rays, but this may be avoided by placing a pipe with perforations along the top of the wall and pumping water through, or, if less expensive, [illegible] is preferable if the work is of an extensive nature. This treatment should be continued for a fortnight, if possible.

One of the least understood questions is that of expansion. This should be treated from several view points. In the first place, do engineers realize that cement, when of the most perfect character and used to form concrete masses, skilfully mixed and placed, has a certain definite action during the process of crystallization? This has no relationship to soundness or unsoundness, high or low temperature of air or ingredients, methods of placing, or density, but is an essential and necessary action arising during the natural process of setting and hardening. The outcome is that contraction in air or expansion under water takes place. But as concrete is usually placed under water in large masses, and as this expansion can be taken up by internal compressive stress, no harmful results follow, whilst on the other hand the contraction in air has certain results, whether this stress is met by reinforcement, by introduction of free joints, or by irregular ruptures, and with the free expansion joints we are now concerned.

The writer's practice is to create an absolute cleanage plan, approximately every 50 feet, unless the wall is shallow and on solid rock. If so situated, the joints should be closer or the adhesion of the concrete to the foundation will create local ruptures. When the wall is to contain water under pressure, evidently the joint must be made water-tight. This may be done either by the use of an oak key or, preferably, by a concrete prism, having an asphalt plug or rod. This is easily introduced, and gives an elastic and perfect seal. The prism should be slightly tapered and swabbed with tar or asphalt, or covered with paper. The sections of wall may be built either alternate or by stair steps, but the separation may be easily effected either by paper or asphalt, as in the case of the key.

Once the hardening process has reached a practical limit, the temperature changes are not serious, and may be disregarded, but the initial shrinkage is, from general observation, within limits, ¼ inch per 50 feet.

In hurriedly designed structures, particularly buildings, another class of cracking is met with, arising from variation in loading. The writer's observation is that not nearly enough attention is given to this, with the result that loads varying from 1 to 3 tons per sq. ft. may be introduced and the compression of the foundations throws local stress of a serious character onto the lower portion of the structure

Suggestions Tending to Advancement

In conclusion, the writer desires to emphasize [illegible] thought, namely, the artificial character of concrete. The ultimate product has been the result of many human agencies. The production has involved the use of skilled and unskilled labor. The chances of imperfection are many, and unceasing vigilance is the price of success. First and foremost, vigilance regarding the cement—a serious effort to secure, by the best tests we can devise, a sound article—but above all by the use of cement properly constituted, chemically, and aged, by taking care of it when it is received, by intelligent proportioning, careful placing, skilful designing, all necessary precautions; and, last of all and not least, [illegible] realizing that we must not trust too implicitly in the permanency of steel reinforcement unless used with great care, so as to minimize the chances of corrosion of the steel by the action of ingredients in the concrete itself, or by permitting even the faintest percolation of air, which will be certain, in due course, to corrode or rust it. Finally, if we are to expect to build a permanent structure and to retain the ultimate respect of the public, it is certain that the treatment of concrete must be natural and not imitative. Each building material has its natural beauty, and the enduring grace of structures made [illegible] of taste in respect to concrete structures will be recognized not [illegible]

Slating and Roof Tiling

The following are the customary rules of measurement as edited and revised by the Standard System of Measurement in London, Eng.

Slating

Slates—Net area, after deducting all openings containing 4 feet superficial or over.

Mansard, vertical, dormer, cheecks, small surfaces under 10 feet superficial, circular, conical, octagonal or turret roofs to be measured separately.

Eaves—A lineal measurement to be taken to the equivalent of 12 inches deep.

If irregular or cut to follow drips of gutters, an extra measurement of 6 inches to be taken.

In the case of all random slating add a further 6 inches.

If bedded or pointed, to be charged separately.

Verges—A lineal measurement equivalent to 6 inches wide to be taken at all square verges, and secret gutters.

If slate and a half or special wide slates are used ,add a further 12 inches.

Top Edge—A lineal measurement equivalent to 6 inches deep to be taken on either side of ridges, under sills of dormers, lanterns, skylights, and any openings where top course slates are used.

Square abutments—A lineal measurement equivalent to 6 inches wide to be taken where slating adjoins sides of all chimney stacks, dormers, skylights, and other openings; also at one end of slope where slating finishes between parapet or party walls.

Circular cutting—A lineal measurement equivalent to 12 inches wide to be taken.

Raking Cutting—A lineal measurement equivalent to 6 inches wide to be taken at all rakes.

Valleys—A lineal measurement equivalent to 6 inches wide to be taken on both sides of all valleys.

If special wide slates or slate and a half are used, take an additional 12 inches on both sides.

Hips and Angles—A lineal measurement equivalent to 6 inches wide to be taken on both sides of all hips and angles.

If special wide slates or slate and a half are used, take an additional 12 inches on both sides.

Mitre Cutting—A lineal measurement to be taken for all mitres (in addition to the usual cutting), whether at hips, valleys, or other places where slates are close cut; to include all necessary oil cement.

Ridge and Hip Coverings—A lineal measurement of all ridges and hips, including setting and pointing in cement.

All splays, cut ends, mitres, intersections and top ends to be numbered and taken separately.

Tiling

Tiling—Net area, after deducting all- openings containing 4 feet superficial or over.

Mansards, vertical, dormer, cheecks, small surfaces under 10 feet superficial, circular, conical, octagonal or turret roofs to be measured separately.

Eaves—A lineal measurements equivalent to 8 inches deep

If irregular or cut to follow drips of gutters, an extra measurement of 6 inches to be taken.

If bedded or pointed, to be charged separately.

Verges—A lineal measurement equivalent to 6 inches wide to be taken at all square verges, and secret gutters.

If on rakes, take an additional 6 inches.

Top Edge—A lineal measurement equivalent to 6 inches deep to be taken on either side of ridges, under sills of dormers, lanterns, skylights, and any openings where top courses are used.

Square abutments—A lineal measurement equivalent to 6 inches wide to be taken where tiling adjoins sides of all chimney stacks, dormers, skylights, and other openings; also at one end of slope where tiling finishes between parapet or party walls.

Circular cutting—A lineal measurement equivalent to 12 inches wide to be taken.

Raking Cutting—A lineal measurement equivalent to 6 inches wide to be taken at all rakes.

Valleys—A lineal measurement equivalent to 6 inches wide to be taken on both sides of all valleys, including all necessary tile and a half.

Bedding and pointing to open valleys to be charged separately.

Valley tiles to be measured extra only, over the usual measurements on both sides.

Hips and Angles—A lineal measurement equivalent to 6 inches wide to be taken on both sides of all hips and angles to include all necessary tile and a half.

Hip and angle tiles to be measured extra only, over the usual measurement on both sides.

Mitre Cutting—A lineal measurement to be taken for all mitres (in addition to the usual cutting), whether at hips, valleys, or other places where tiles are close cut, to include all necessary tile and a half.

Ridge and Hip Coverings—A lineal measurement of all ridges and hips, including setting and pointing in cement.

All splays, cut ends, mitres, intersections and top ends to be numbered and taken separately.

Permanent Fence Posts

Concrete fence posts are rapidly coming into general use. Only a few years ago the farmer who was enterprising enough to adopt them was thought by his neighbors to be spending his money extravagantly. To-day in these same localities posts of this kind are common and are being generally adopted by thousands of the most progressive farmers in all sections of the country. One western farmer makes all his own posts in a mould which he has designed himself and is at present preparing to use them in fencing his entire property, consisting of 160 acres.

Proper Mix for Concrete

A correspondent writes:

I have an argument on hand as to the proper way to put in concrete, that is, to make the best work. I have never seen it proven, whether it makes the best work in walls put in wet or mushy, or if put in wet enough just to tamp. Is there any rule which can be followed to determine amount of water to be used in mixing concrete?

Answer—In practice there is no rule which can be used to determine the exact amount of water required in mixing concrete. The class of work is usually considered the governing factor. The condition of the weather, the dryness of the sand, gravel and crushed stone, the proportions of materials, the time of removal of forms, and the required density of the concrete also govern the amount of water to be used. Under ordinary conditions the concrete should be of such a consistency that when tamped it will quake and water will flush to the top.

In order to obtain a dense watertight concrete, enough water should be used in mixing to ensure the closing of all the voids; in other words, concrete should be wet enough so that it can be puddled instead of tamped. In this case the thin mortar will flow, filling the spaces between the larger aggregate, thereby producing a dense concrete. This does not mean, however, that an excess of water should be used; if mixed too wet the water will have a tendency to wash the cement from the sand and gravel or crushed stone, and to separate the mortar from the large aggregate.

Projected Harbor Extensions at Montreal

Details of Important Scheme Recommended by Board of Engineers, for which is Asked an Initial Expenditure of $2,500,000 -Other Montreal News

Montreal Office of "The Contract Record,"
April 9th, 1910.

Full particulars are now available concerning the scheme of harbor extensions (for which a loan of $6,000,000 is being asked) now before the Dominion Government.

Consultative Board of Engineers.

On March 31st, 1909, the Chief Engineer reported to the Commissioners that the comprehensive scheme of harbor extensions which he had been instructed to prepare, in May, 1908, was so far worked out that he desired the authority of the Commissioners for the engagement of a Board of Engineers to go over the plans with him, for consultation and report.

With the authorization of the Commissioners, the following gentlemen were invited to join the Board, under the chairmanship of the Chief Engineer, and they all kindly accepted and gave the matter their earnest consideration.

Mr. John Kennedy, Consulting Engineer.

Mr. Arthur St. Laurent, Engineer, Georgian Bay Canal.

Mr. Henry Holgate, Consulting Engineer.

Mr. G. J. Desbarats, Deputy Minister Marine and Fisheries.

Mr. Louis Coste, Consulting Engineer, Public Works of Canada.

Mr. Ernest Marceau, Superintending Engineer, Quebec Canals.

The first meeting of the Board was held in the Chief Engineer's office, Harbor Commissioners Building, April 24th, 1909.

A memorandum of instructions, dated April 21st, was read, and the Harbor Commissioners personally welcomed the Board, and desired that, after their consultation, a scheme would be recommended which would not only meet the ever-increasing requirements, but would result in making the port of Montreal one of which Canadian could be proud.

The report and plans of Mr. R. C. H. Davidson, M. Inst C.E., an eminent English dock engineer, who had, at the request of the Harbor Commissioners in 1907 made a study of the situation at Montreal with a view to designs for harbor improvements, having in the meantime been received, the Commissioners asked the Board of Engineers to take them into consideration, the Commissioners being desirous of having as wide a range of expert opinion as possible in connection with the port and its economic development.

Nine meetings were held, the full Board being present; and seven meetings of the committee for the drafting of the report of the conclusions of the Board.

On October 31st, 1909, after a thorough discussion and consideration of the problems placed before them, the Board of Engineers unanimously agreed upon outline plans and a programme of works, which they submitted to and recommended for adoption by the Harbor Commissioners.

The complete scheme of [illegible] prepared by the Harbor Commissioners' Chief Engineer, and the estimates prepared, were endorsed throughout, with one exception, and as recommended by the Board several improvements and modifications were worked out which will greatly improve the [illegible]

Scheme Recommended by Board of Consultative Engineers.

The scheme of [illegible] to be carried out [illegible] the increasing business of the port during that time, that being, according to the opinion of the Board as far into the future as the requirements of the trade could well be foreseen.

The Board reported that [illegible] commenced forthwith and carried out within the term of from 8 to 12 years.

The chief characteristics of the scheme of improvements thus outlined and the advantages to be gained by carrying them out may be summed up as follows:—

There will be added in the most advantageously situated parts of the harbor:—

1. New high level quays so arranged as to give berths for 24 ocean vessels of from 600 to 800 feet in length; aggregate frontage, 16,800 lineal feet.
2. New low level quays, 5,800 lineal feet.
3. Combined area of the new high and low level wharf spaces and extensions, 74 acres.
4. New sheds, floor area, 1,386,000 square feet.
5. Two new elevators with extensive conveyor system, combined capacity 2,000,000 bushels.
6. Additional high level railway tracks on the wharves, 22 miles.

The Board of Consultative Engineers, of which the Harbor Commissioners' Chief Engineer was a member, recommended that the time for construction should extend over a period of 8 to 12 years, and that the appropriations for the first two years should be at the rate of about $2,500,000 per year, the large appropriations for the first two years being to provide the rapid construction of elevator No. 2, the anchorage banks in the Lapriatie Basin, the new Victoria Pier and Market Basin, and the extension of the high level railway tracks along the harbor front.

The board of Engineers reported with reference to the proposed overflow dam between the Guard Pier and St. Helen's Island, which would make the central part of the harbour now the St. Mary's current, a still basin at low water and with a comparitively slight current at high water in the spring, that after a careful examination they omitted it from the list of works recommended because it would entail a very large expenditude in fulfilment of the recommended plan, would so enlarge the crosssections of the river as to appreciably lessen the present St. Mary's current. They reported that should it be subsequently desired to completely eliminate the St. Mary's current it would be quite practicable to further deepen and widen the South channel and to build an embankment dam between St. Helen's Island and the Guard Pier, which would convert a large part of the Harbour into a still water basin, allow of much more advantageous arrangement of wharf space, and increase the safety and convenience of navigation. All the works recommended for that part of the harbor are so designed as not to prevent this being ultimately carried out.

The Board called the attention of the Harbour Commissioners to the desirability of changing the sewer outlets in te Harbor to such positions as would ensure their discharge into running water.

The programme of works as recommended by the Board of Engineers covers work which will double the capacity and con[illegible] of the harbor and will require a period of [illegible] years for completion.

Details of Programme for 1910.

1. Grain Elevator No. 2. Capacity, about 2,000,000 bushels. [illegible]

piles to rock. To be completed ready for operation October, 1911. Appropriation for 1910, $800,000.

2. High level railway tracks from the high level wharves above the Victoria Pier until Hochelaga and Molsons Creek, available for winter and summer use. Three tracks and all crossings down as far as Hochelaga to be by subways. Appropriation for 1910, $200,000.

3. New Victoria Pier and Market Basin. The up-stream and outside wharves to be high level for ocean vessels, and all the inside to be low level for river craft, giving 2,700 lineal feet of wharves having a depth of 35 feet at low water for ocean vessels and 4,000 lineal feet for river vessels. Appropriation for 1910 for [illegible] feet of high level wharf and 800 feet permanent low level, and other works, $400,000.

4. The completion of the Dominion Coal Company wharf at Hochelaga, length 291 feet. Appropration for 1910, $100.

5. Dry-dock. The Commissioners are pleased to announce that a well-known British firm will proceed at once to construct a large floating dock with a lifting capacity of 25,000 tons net, and able to dock the largest vessels now afloat. This firm, in addition to constructing a floating dock, will also erect in conjunction with it a large ship repairing plant.

Opening of Navigation Delayed

The Government ice breakers reached Montreal last week, announcing the river clear of ice as far as this city. On top of this we are informed that it will be fully another month before the local canal system will be available for service. The reason given for the delay is the extensive repairs that will be necessary to make to the canals before they can be watered. It seems rather unfortunate when we are favored with ideal condition for the early opening of navigation that delay should be caused from such a source. On the other hand, it is questionable whether the larger ocean vessels would be willing to inaugurate an early sailing season to the port of Montreal, owing to the fact that insurance companies demand almost prohibitive rates from vessels venturing to this district in the early spring months. Apropos of this we note that the Montreal Board of Trade has decided to address the Department of Railways and Canals, asking that in future the St. Lawrence Canal be opened much earlier than heretofore.

Sinking Foundation Piers with a Shield

The new passenger terminus of the Chicago and North-Western Railway at Chicago has about 100 foundation piers sunk to rock at a depth of 115 ft. to 120 ft. below the surface. They pass through about 15 ft. of earth and made ground, and 60 ft. of blue clay, to a shale bed, 10 ft. to 20 ft. thick, which overlies a water-bearing stratum of sand and gravel with boulders. The quantity of water was so great that the open pit excavating system had to be abandoned. The 5 ft. open pit was carried down into the clay, being lined with vertical, tongued, and grooved planks, braced by interior steel rings. Then a chamber was excavated and filled with concrete, in which was embedded an air lock 4½ ft. in diameter and 6 ft. high. In the excavation below the lock, was erected a shield, consisting of a steel ring or shell, 3½ ft. high, with a cutting edge. This was forced down by jacks, and at each 3 ft. of advance the excavation was lined with the plank lagging and steel rings. Considerable trouble was experienced with the escape of air through the sand and gravel, the air being noticed at excavations half a mile distant. When the well or excavation reached the rock its interior angle rings were removed, but in most cases it was not possible to recover the shield. The rock having been cleaned, concrete was deposited as rapidly as possible, the angle iron rings which braced the lagging being removed as the concrete reached them. When the concrete reached the lock, this was removed, and concreting continued to the surface, making a solid cylindrical pier of concrete, 5t. diameter. The forcing down of the shield was done by four 10-ton jacks.

Fort William Water Supply

An extensive paper on the Fort William water supply, prepared by Mr. H. S. Hancock, Jr., engineer-in-charge of the Fort William Waterworks Department since 1906, was read before a meeting of the general section of the Canadian Society of Civil Engineers, on the 7th inst.

In the absence of the author, the paper was read by Mr. R. S. Lea, of Montreal. The paper outlined the development of the city's water problem since 1906.

The source of the water supply is Lock Lomond, situated approximately six miles south of Fort William, and to bring and distribute water throughout the city proved an engineering task of no small moment, owing to the exceptional difficulty of securing proper labor and supplies. The tunnel into the city was completed June 31st, 1909, at a total cost of $450,812.

Summary of the Cost of the Work.

Section 1.			
By contract		$93,475.70	
Day labor		29,453.11	
Engineer, Supt. and Legal		3,493.21	
			$126,422.02
Section 2.			
Pipe line		$44,197.93	
Roads		2,158.23	
Reservoir		23,106.03	
Engineer, Supt., Inspection		2,625.40	
			72,087.59
Section 3.			
Tunnel.			
Labor	$73,312.23		
Material	26,053.63		
Fixed charges	35,908.95		
Superintendence	6,974.09		
Engineering	3,740.00		
		$145,988.90	
Outside Work.			
Roads	$6,858.10		
Concrete culvert	8,933.42		
Gate house	2,120.95		
Intake pipe	17,900.02		
Forebay	10,182.95		
Employers' Liability Ins.	915.61		
Engineering	1,246.33		
By-Laws and Legal		519.79	
City contingency account		741.00	
			195,407.07
Section 4.			
Pipe line		54,749.09	
River crossing		1,015.40	
Engineer and Superintendent		1,131.20	
			56,895.69
Grand total			$450,812.37

City Engineer Jones, of Brantford, Ont., paid a visit to New York City last week to see a test of certain cement sewer pipes. Tenders were recently called for by the city of Brantford for cement tiles. Among the tenders was one from a New York firm, $6,000 less than any Canadian bid.

The American Society of Civil Engineers will convene at Ottawa the last week in June or the first week in July. The visitors will be entertained by the Ottawa branch of the Canadian Society of Civil Engineers.

Senator Edwards of Ottawa, has been elected president of the Canada Cement Company. The preferred stock of the company has been put on a dividend paying basis at the rate of 7 per cent. per annum.

Our Winnipeg Letter

Office of "Contract Record,
Winnipeg, April 8th, 1910.

Building operations are now in full swing. The season is at least a month earlier than ever before. This is due partly to the exceptional weather and partly to the large number of plans that developed in the fall and winter.

Building material is in great demand, and will be more so as the season advances. Inquiries made by this office indicate that no great stocks of building material are held in the West. Quite a number of brickmakers say they have no stocks in hand, that their output is all contracted for, etc. If this is true, it will not be long before brick manufacturers away from the vicinity of large cities and United States dealers will be called upon to fill the shortage.

There has been "something doing" in paint during the last few weeks. Flaxseed prices have been soaring high in the United States. Consequently a gallon of boiled linseed oil which sold for 80 cents a year ago is now held at $1.30—and apparently the end is not in sight. One day the paint manufacturers had to swallow a jump of 25 cents in one day. Everything is quiet in labor circles, and there are no grounds for anticipating serious trouble from this source.

Vancouver Correspondence

Building Records being broken at the Coast Stiffening Tendency in Some Materials Items of Interest

Office of "Contract Record,"
Vancouver, B.C., April 8, 1910.

With the building season well started and with all kinds of construction work in sight, backed up by a total of approximately one and one-half millions for March permits, everything is humming in this city. Building Inspector Jarrett is continually breaking records. One day recently in the short space of six hours he was called upon to inspect plans and issue permits for no less than seven new apartment houses, all of good dimensions.

The prices of many lines of building material are evincing a tendency to stiffen, and the probability is that before the season gets very far advanced there will be a really formidable jump in the construction cost of the ordinary home as compared with last year.

McDonald & Co., who have a contract for supplying about fourteen miles of 25-inch iron pipe to the corporation of New Westminster, have commenced operations. The plant, though small, is very complete, all the heavy machines for rolling, punching and rivetting were brought from Grand Forks, B.C., where Mr. McDonald formerly conducted a business. The pipe will be made of rivetted sheet iron, and the output will be about 330 feet of pipe per day. Mr. McDonald has manufactured pipe for the Granby smelter, for Portland, Seattle and other Coast cities, and expects to continue in business in New Westminster after completing his contract with the city.

Contractors do not always make the proverbial barrel of money. Take the Lulu Island bridge at New Westminster as example. The people who built it lost [illegible], the amount representing the excess of the actual cost of the bridge over their estimates.

As a result of the repeated protests and warnings emanating from Building Inspector Jarrett, of Vancouver, the City Building Committee has empowered him to demand a higher standard of construction for apartment houses to be built. The new regulation requires that all apartment houses [illegible] in height and having three or more suites on each floor, must be of mill construction.

The new Court House in Vancouver, though still far from completion, has been so long under construction that already it has been found inadequate for the needs of the city. The Government has ordered the addition of a new wing on the Robson Street side, which will cost $200,000. This will make the cost of the finished structure about one million dollars.

There appears to be good grounds for believing that the long-talked-of bridge across the Second Narrows, connecting Vancouver with ambitious North Vancouver, will be undertaken by a syndicate of capitalists in the near future, the Provincial Government and interested municipalities having promised liberal grants.

Progressive North Vancouver

Indications point strongly to the probability of North Vancouver securing in the near future a great industry in the Pressed Steel Sleeping Car Company. Mr. C. Wilson, of Seattle, who is at the head of the capitalists, is interested. It is stated that a million dollar plant is to be installed, which will require a large staff. These cars will be decidedly new departures from the ordinary railroad cars, being made almost entirely of steel and almost unbreakable. There are parts of wood in their manufacture, but this wood amounts to but little. One of the features, it is said that they combine, is that every compartment is practically a separate stateroom in place of berths, as in the average sleeping car. The berths shove up to the ceiling out of the way of the traveller, who may, when he desires, extract a washstand and other necessary travelling conveniences out of the floor of his room.

The city of New Westminster is laying a considerable mileage of new cement pavements, the color being terra cotta. City Engineer Blackman states that in many English towns and cities these pavements are taking the place of the old white cement, which reflected the sun to a much greater extent, so that persons of weak eyesight were obliged to wear blue glasses.

Another huge office building is to be added in the near future to the half-dozen or so constructed in Vancouver during the past twelve months. The Dominion Stock and Bond Corporation, recently organized with a capital of $2,000,000, will be the owners, and contemplate putting up a twelve-storey building to cost $600,000. The site favored is the southwest corner of Howe Street and Hastings Street West.

Victoria Paving Problem

Victoria's City Council has been wrestling with a paving problem. Work had been approved which would require a million and one-half blocks, but prices have risen. The tenders received from local milling companies showed that wood blocks now cost from $14 to $16 per thousand, which three years ago cost but a trifle over $6. It cost $2.87 to lay a block pavement in 1908; last year it cost $3.70, and this year the figure would be in the neighborhood of $4 per square yard. The establishment of a municipal block factory is talked of.

Municipal engineers in many places seem to experience a lot of trouble with electrolysis, but here in the West we do not have many complaints, the reason being that we put down wire-wound wood pipe for water systems, the use of which will soon be general throughout the prairie towns. The advantages claimed for wood pipe are economy in cost, durability and greater discharging capacity. The extensive plants of the Pacific Wood Pipe Co., the Canadian Wood Pipe Co., and the Municipal Construction Co., of Vancouver, and the Dominion Wood Pipe Co., of New Westminster, may be mentioned as the principal in this line. Practically all the wood [illegible]

An action has been entered by the Ontario [illegible] Company against the municipality of [illegible] to recover the [illegible] of a [illegible] contract [illegible] the purchase of [illegible] required for [illegible]

Mr. W. A. McLean

Provincial Highways Engineer for Ontario.

Mr. W. A. McLean, Provincial Engineer of Highways, Ontario, is of Scottish and United Empire Loyalist descent and belongs to a well-known Elgin County family. His education was received in the collegiate institutes at Ingersoll, Strathroy and St. Thomas, with a special course at the School of Practical Science, Toronto. After spending a year as reporter and editorial writer on the St. Thomas papers, he entered the office of the St. Thomas City Engineer, where, during the three years preceding 1896 he was engaged in general municipal work on sewers, waterworks and pavements, together with municipal drainage. In 1896 he entered the Provincial service as assistant to Mr. A. W. Campbell, Commissioner of Highways. With the recent promotion of Mr. Campbell to the Federal service, Mr. McLean becomes director of the Highways Division of the Ontario Department of Public Works.

Mr. W. A. MacLean, Provincial Engineer of Highways, one of the most active supporters of the "Good Roads" Movement.

Thus closely identified with the "Good Roads" movement for over fourteen years, Mr. McLean has devoted special attention to bridge construction, has the designing of a large number of highway bridges to his credit, and through the publications of his Department has done much to improve the standard of highway bridges throughout the Province.

Since the passing of the Highway Improvement Act in 1901, whereby the Province contributes one-third of the cost of county roads, Mr. McLean has, as engineer, represented the Province on this work. He has had charge of various model roads in the Province, and has been widely consulted by town councils as to methods of street improvement.

Mr. McLean is a member of the Association of Ontario Land Surveyors, and of the Canadian Society of Civil Engineers. By experience and training he has specialized in all branches of highway engineering including roads, bridges and pavements. In accordance with past methods of the "Good Roads" office, reports and bulletins will be issued; and so far as more definite duties permit, his services will be available to all municipal councils for consultation by correspondence or personal visit.

Enthusiastic as to the future of road improvement in Canada, and the efficiency of present Provincial measures, Mr. McLean urges that the greatest good can come from a thorough reorganization and reform of township road systems in such a way that the present large expenditure will be effectively directed.

An Ancient Concrete Bridge

In the south of France is a concrete arch bridge known as the Pont du Gard, which was erected in the year 56 B.C. The concrete in this was not composed of crushed stone or other small aggregate of the variety now employed in concrete bridge work, but was of the old style, consisting of alternate layers of large and small stones, gravel, etc., and of cementitious materials. Vitruvius describes the materials and methods in use before the Christian era, and other writers, like Alberti in 1845, and Polladio in 1570, accurately describe the method which the "ancients" (as they call them) employed, "of using boards laid on edge and filling the space between with cement and all sorts of small and large stones mingled together." It is very improbable that the Pont du Gard would have withstood the rigors of the Canadian climate, but its actual state of preservation, as well as that of many other specimens of ancient concrete work, proves that if modern work is honestly executed it will many times outlast any reasonable bond period, so that a very small yearly sinking fund per cent. is all that is required for properly designed and erected concrete work.

A Side Light on the Winnipeg Plumbers' Union

The counsel of the Winnipeg Plumbers' Union, who has just returned from London, Eng., after getting the worst of it in the Privy Council on the right of a union to picket during a strike, gives it as his emphatic opinion that the Union lost its case owing to its inability to produce the necessary records when the action was first called, thereby making it impossible to learn who was actually responsible for the strike and for the administration of the Union's affairs. Unfortunately for the Union, however, the Privy Council took the view that if any body of men purposely destroyed their Union records they must have something to conceal, which entitled them to little consideration. And it was this view that resulted in the prompt decision of the Privy Council to refuse the right of appeal.

Montreal's Proposed Subway

The promoters of the proposed subway for Montreal are apparently working energetically in the preparation of the necessary preliminary details for this extensive project. It is stated that the route of the new subway will connect the eastern and western ends of the city and at the same time a cross line will be built from the river front northward. There is a persistent rumor that the Canadian Northern Railway Company will be prepared to give the scheme every support, since it would allow them an excellent entrance way to the centre of the city. The organization of a syndicate to carry out this work is said to have been completed. It involves English, American and Canadian capital to the extent of $20,000,000. Montreal financiers said to be interested in the project are Messrs. Rodolphe Forget, M.P., H. S. Holt and W. G. Ross.

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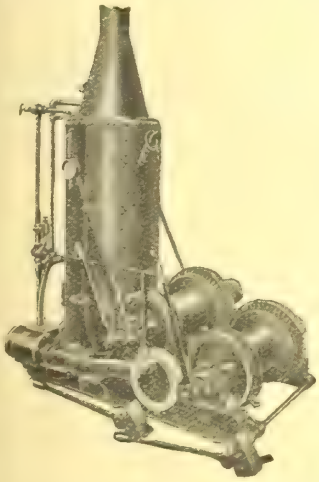

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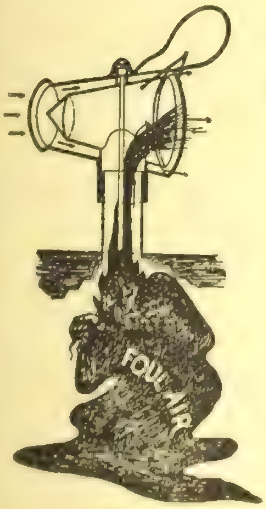

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Personal News and Notes

Mr. John Roger has been appointed county engineer of Perth, Ont., to succeed Mr. G. L. Griffith.

The Vancouver city council is considering a proposition to engage an expert supervising engineer for the city.

We regret to report the death of Mr. Geo. Parsons, a well known contractor of Brantford, Ont. Mr. Parsons was only 27 years of age.

The Canada Foundry Company have organized a department of field erection, of which Mr. J. J. Scollan has been appointed superintendent.

Jens Orten-Boving & Co., hydraulic engineers, London, Eng., have opened offices at 164 Bay St., Toronto, under the charge of Mr. F. A. Yerbury.

Hon. A. P. McNab, Minister of Public Works for Saskatchewan, is visiting Vancouver and the Coast. Mr. McNab is recuperating from a recent illness.

Mr. A. W. Campbell, Deputy Minister of Railways and Canals, delivered an interesting address at Mocton, N.B., last week on the subject of street improvements.

Mr. R. H. Saunders, late of the Waterworks Department, Toronto, has accepted a position with Mr. J. M. Wilson, who was recently appointed city engineer of Moose Jaw, Sask.

Mr. Geo. Powell, Roadway Engineer for the city of Toronto has been recommended for the position of assistant city engineer made vacant by the resignation of Mr. T. S. Scott.

The contract for the construction of an important branch line in Saskatchewan, the new road from Yorkton to Kenora, has been awarded to Peter Veregin, formerly leader of the Doukhobor contingent.

According to a recent dispatch from Cambridge, Mass., a Harvard professor of civil engineering is so impressed with the value of practical work that he has hired out temporarily as a laborer at $1.50 per day.

The contractors who have just completed the Lulu Island bridge, New Westminster, B.C., lose something in the neighborhood of $30,000 on their venture, this amount representing the excess of the actual cost of the bridge over their estimates.

The Victoria City Council received a petition recently from a number of property owners asking that certain paving work should be done by contract and stating the belief that this would effect a saving of from 80 to 100 per cent. over day labor.

A visitor of Winnipeg last week was Mr. Patrick Hirsch, a prominent railway contractor of New York City. Mr. Hirsch is reported to aspire to the construction of some of the important railway works that are to be carried out this year in the Canadian west.

A strike of the building trades which would affect 350,000 workers, is threatened in Germany, owing to the rejection of the wage scale offered by the master builders. It is possible that a revised wage scale will be drawn up by an equal number of representatives of employers and employed.

The National Iron Works, Toronto, commenced operations last week, when Mr. Cawthra Mulock poured the first pipe. The new plant is claimed to be the most up-to-date foundry on the continent. The company have a considerable number of important contracts in hand, including a large order for 16-inch pipe for the city of Toronto.

Mr. R. E. W. Hagarty, Toronto, Secretary-Treasurer of the Canadian Cement and Concrete Association is leaving New York on the 26 inst. for an extended trip to Europe. Mr. Hagarty is desirous of improving his knowledge of general engineering work as carried on in the Old World and of studying European systems of engineering organization.

The Builders' and Contractors' Association of Essex have secured new quarters in the new Thompson Block, Windsor, Ont. The formal opening of these rooms took place on April 5th, when a euchre contest was held, the successful players being Messrs. Penington, Parker and Laisser. An enjoyable banquet was held afterwards. A committee of the Association has been appointed to co-operate with the Board of Trade and the Windsor City Council in matters pertaining to the general advancement of the city.

A meeting of the Manitoba Association of Architects was held last week at Winnipeg, Mr. J. H. G. Russell, president, occupying the chair. The principal business was in respect to a communication from the Ontario Association of Architects, which stated that it was the intention of that body to take active steps to regulate the American invasion of Canadian territory. It was decided to prepare data in respect to the work handled by American architects and contractors and to have the information thus secured placed before the provincial and Dominion governments.

Answering a question relative to the recent competition by Canadian architects for design for new departmental building at Ottawa, the Minister of Public Works stated last week that the Government had awarded the prize to the architects whose designs were considered best by the judging Committee. The Government had not adopted any of the designs, as none was considered suitable to build upon. It was intended to build on another design prepared by the department. This action was not regarded as a breach of faith with the Canadian architects, as the conditions under which they tendered provided that the designs for which prizes were awarded should become the property of the Government.

Big Contract for Progressive Toronto Concern

The Don Valley Brick Works have secured the contract for the brick required in the construction of the Museum Building to be erected by the University of Toronto. The facing brick, of which approximately half a million will be required, are the "J.A.P." variety, a semi-vitreous, variegated shade of dark buff brick, 12 in. long and 2½ in. thick, manufactured according to the specifications of the architects, Messrs. Darling & Pearson. The company report trade exceptionally good. They are at present turning out from their plant 200,000 brick a day and are providing for an increased output of 10 per cent. by extensive additions to their machinery and kilns. Mr. Bowman, the manager of the concern, considers that the contracts under way and others anticipated for the present year are the largest Toronto ever knew. One of the best features of the situation, in Mr. Bowman's opinion, is the increasing sense of loyalty to Canadian architects. Apropos of this subject Mr. Bowman may be interested in an article published on the first editorial page of this issue.

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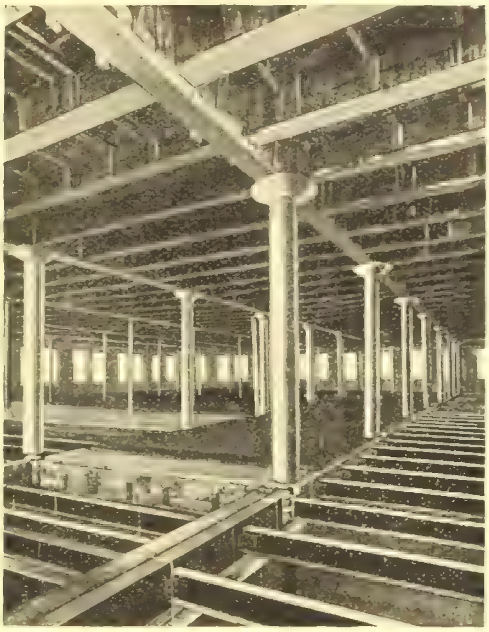

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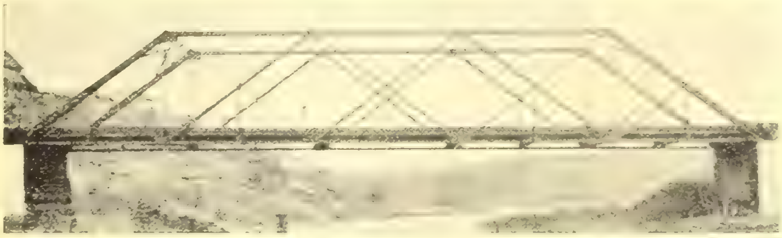

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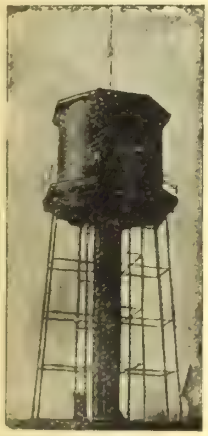

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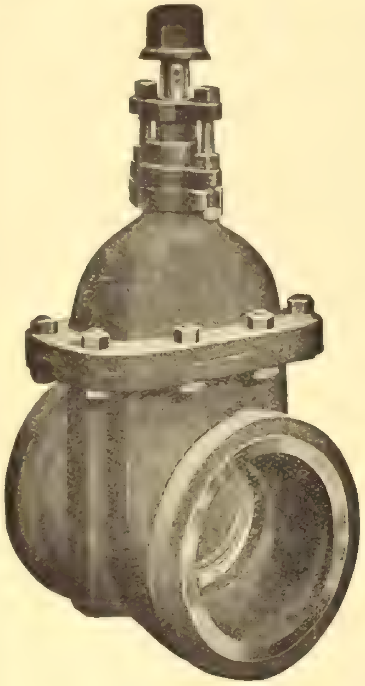

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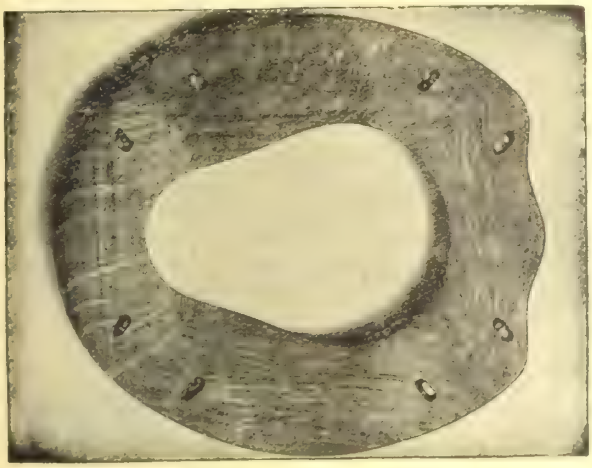

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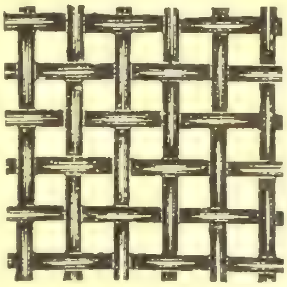

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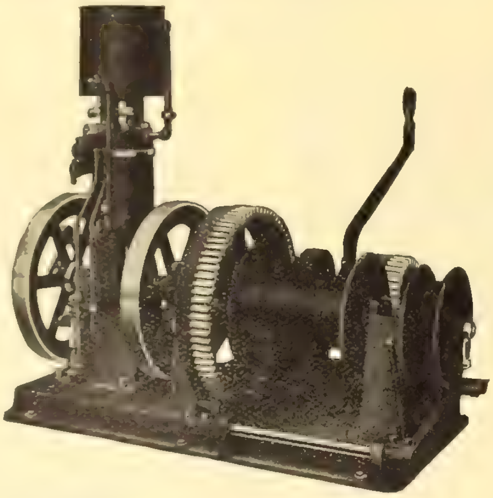

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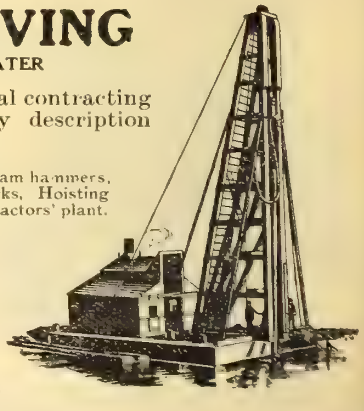

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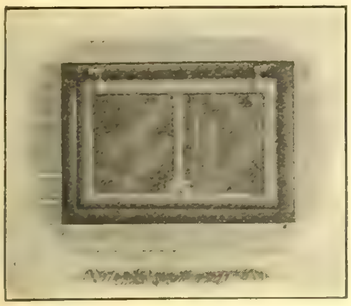

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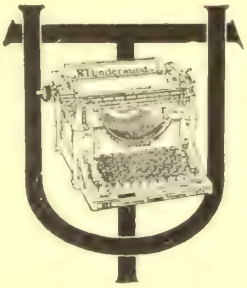

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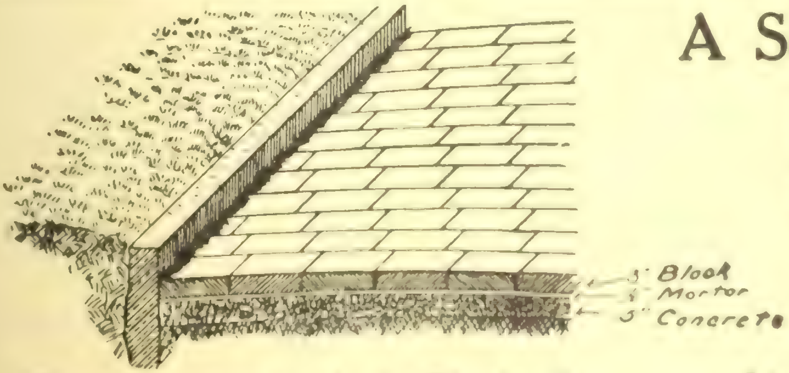

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60 u. i,	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
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¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

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Light pipe 60 and 10 per cent.; fittings, 70, 50 and 10 per cent.

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Boiled Linseed Oil, in barrels, 85 cents per gallon of 9 lbs.

Raw Linseed Oil, in barrels, 82 cents per gallon of 9 lbs.

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Pure Linseed Oil Putty, 25-lb. tins, $3.50 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $3.00 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Simpson Bros., contractors, Montreal, Que., have dissolved.

Amoit & Lemay, contractors, Montreal, Que., have dissolved.

Senecal & Smith, builders, St. Boniface, Man., have dissolved.

Blight & Fielder, builders, Chatham, Ont., have dissolved partnership.

H. W. Field, plumber and tinsmith, Toronto, Ont., is retiring from business.

The Midland Brick Company, Midland, Ont., have advertised their business for sale.

Parkin Elevator Company, Limited, Hespeler, Ont., have assigned to Winfield Brewster.

G. B. Gordon, lumber manufacturer, Gilbert Plains, Man., has been succeeded by Logan & McDonald.

John E. Williscroft, lumberman, St. Edmunds township, Ont., is stated to have assigned to G. T. Clarkson.

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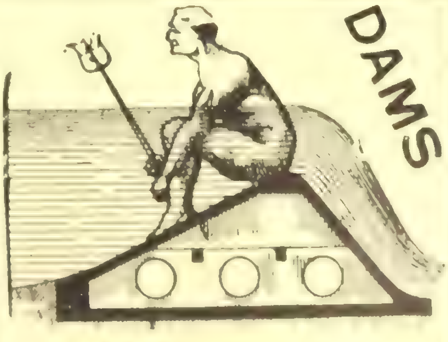

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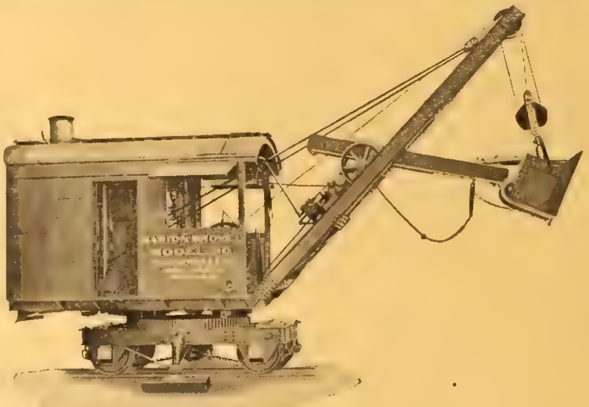

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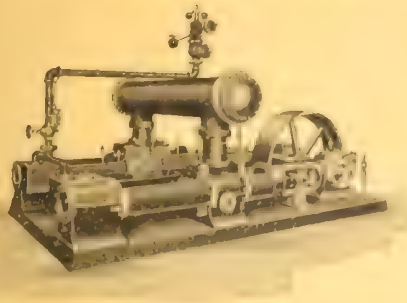

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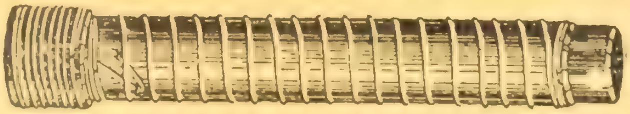

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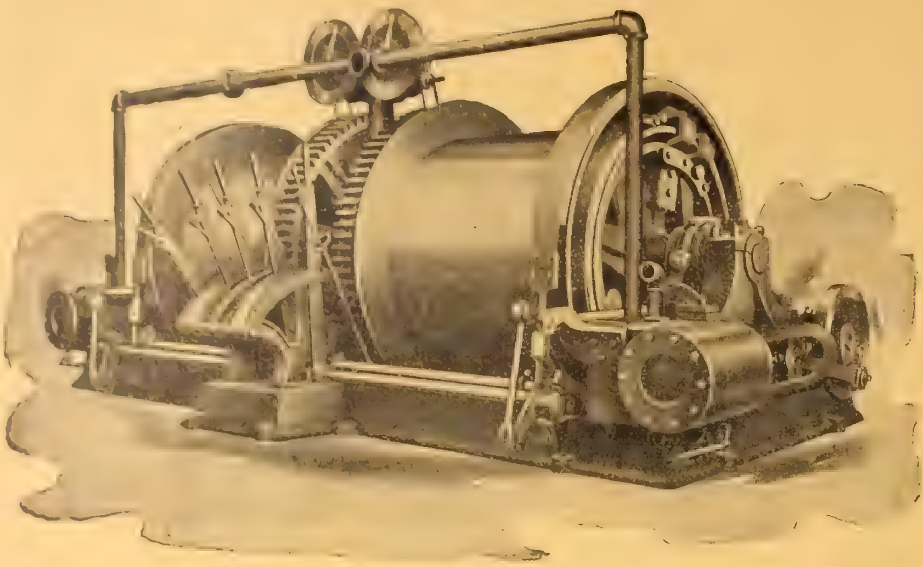

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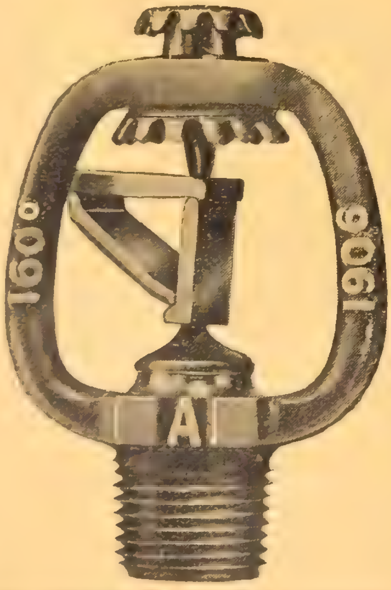

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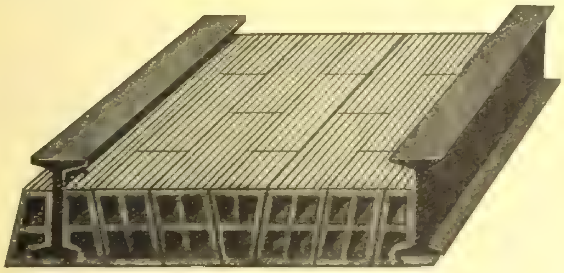

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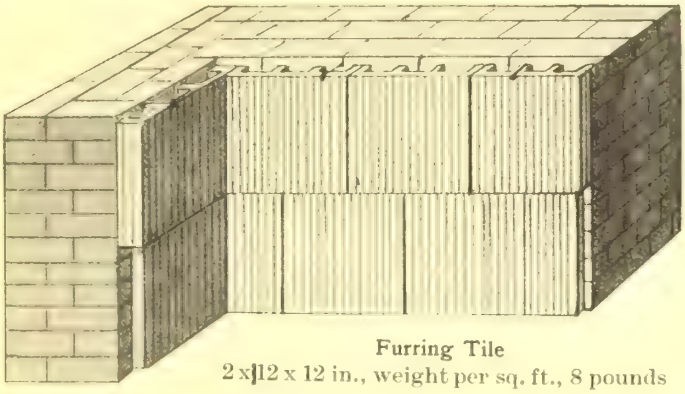

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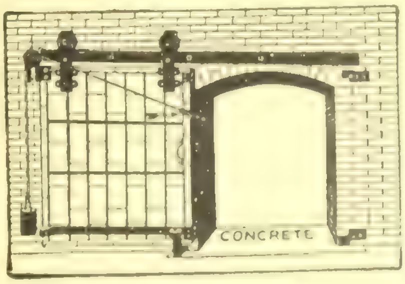

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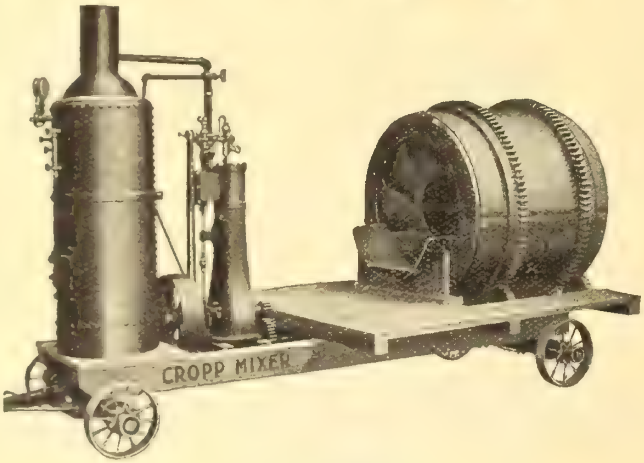
Cropp Mixer



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Dredges, Ditchers, Derricks, Steam Shovels
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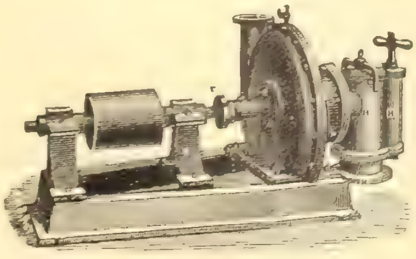
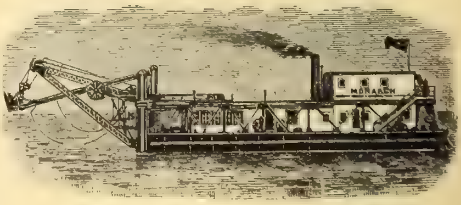


Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



The Champion Street Cleaner

—is the only machine that will effectually clean mud and dirt from macadam and stone streets. The teeth or feet are flexible, so that they will follow the indentures of the roadway and the streets can be thoroughly cleaned. Every Municipality should have one or more of these machines. Two horses and a man can thoroughly clean several miles of streets in a day, and it makes no difference how wet and muddy they are—the more so the better This machine has been thoroughly tested for several years, and the following are a few of the points in which it is used :

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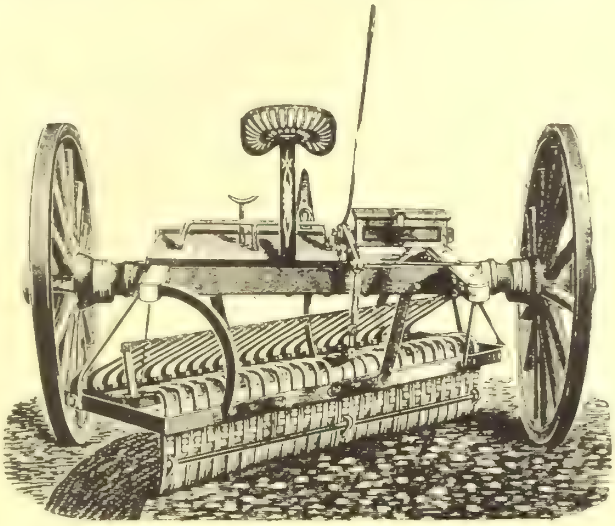

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Brantford "Automatic" Batch Concrete Mixer

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues

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"I cannot doubt but that the manner in which the defendant has offered its goods to the public, advertised them —the similarity of the labels; similarity of combination in catalogue, the use of the word 'STANDARD,' were fitted to deceive the public, and are proved, in some instances to have deceived the public. Nor can I doubt that such deception was the object kept in view by the defendants' manager." — Extract from Hon. Mr. Justice Archibald's judgment in recent suit of the Standard Sanitary Mfg. Co., Pittsburg, Pa., against the Standard Ideal Co., Port Hope, Ont.

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Genuine "Standard" Goods are

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Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
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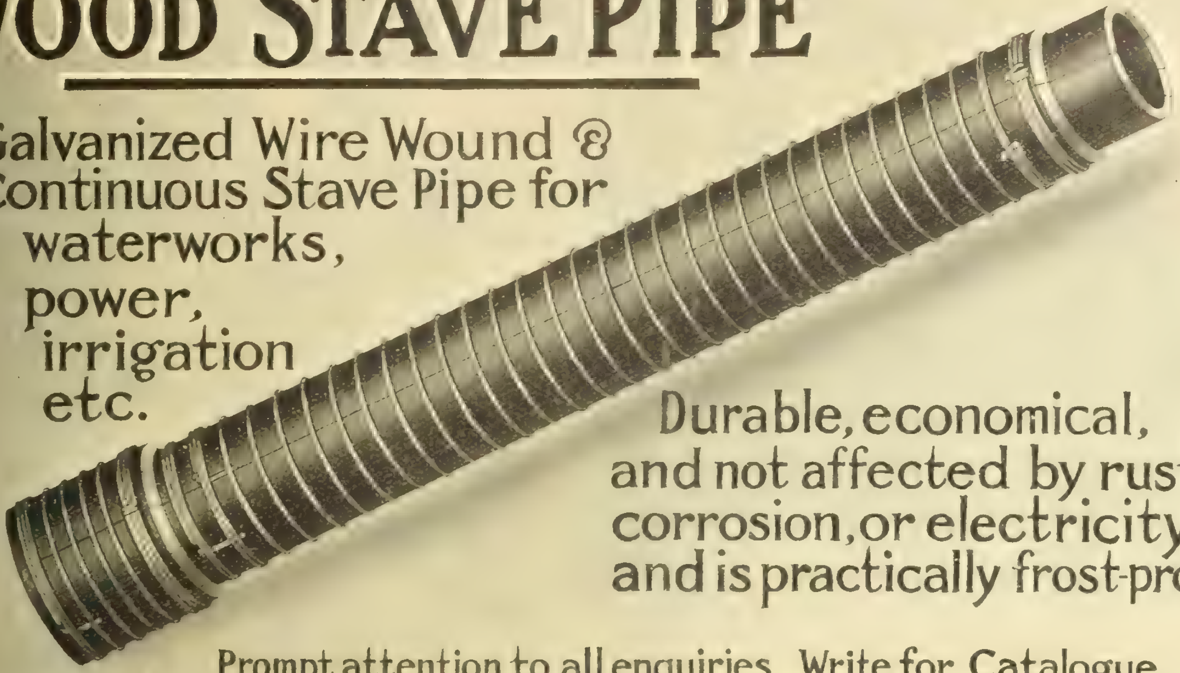
etc.



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and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

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With this scientific system, daylight entering a room is bent and handled by means of accurately formed Prismatic Angles in such a manner as to insure it being thrown to places where it is wanting. Always specify Luxfer and always get the best daylighting results.

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Our facilities are unequalled and we can insure prompt and complete deliveries.

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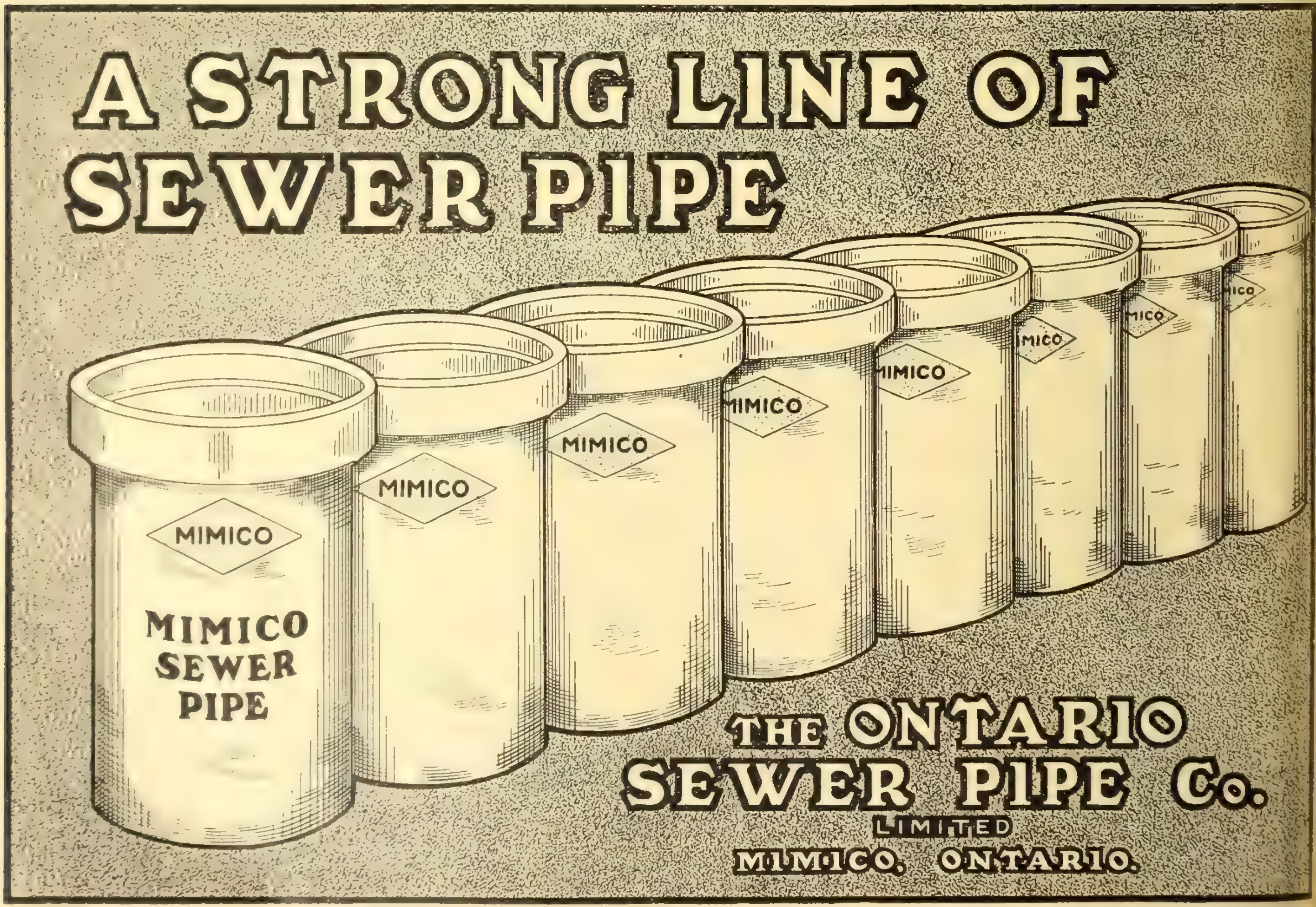
Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**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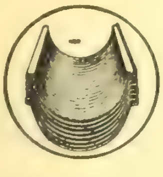
MIMICO
MIMICO SEWER PIPE
THE ONTARIO SEWER PIPE Co.
LIMITED
MIMICO, ONTARIO.

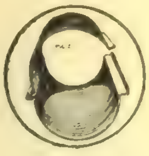
Read why PEDLAR NESTABLE CULVERT

saves farmers money lowers taxes—betters roads

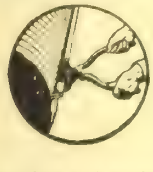
THESE culverts of mine are a great thing for the farming world. They not only make good roads possible, but they serve the farmer in many other ways. And they are so simply laid. They come nested like this:



This compactness saves freight and makes it easy to handle them. You put the sections together like this:



Then you clamp the flanges together like this:



And you've got a piping that will outlast anything of the kind there is. Better get the book and sample and study it.

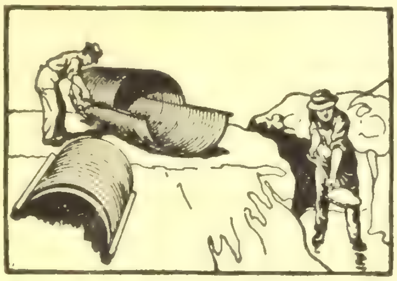
G. H. Pedlar

GET your township reeve or warden to study Pedlar Culverts. Send for the Free Book and show him why this Culvert surpasses for all ditch drainage, for restraining small streams, for every use that any culvert can serve. You will profit through lowered taxes, better roads and abolished washouts. Send for the book and interest your township's officials. You will benefit by what they will learn.

For a very moderate cost you can instal a perfect sewage-disposal system on your farm, using a suitably-sized Pedlar Culvert. You can realize the full value of the liquid manure your animals produce by draining your stable floors with Pedlar Culvert—and that highly valuable manure is usually wasted on farms. Pedlar Culvert makes it easy to water your cattle in winter. And there are a score of other uses for it on the farm.

Nothing vies with Pedlar Culvert as a well-curbing or a cistern lining. The thick galvanizing absolutely protects the metal of these Culverts from rust or corrosion, and the metal itself protects the water supply from contamination. For draining swampy spots around the farm, or for irrigation ditches and under-drains Pedlar Culverts far excel tile or cement piping, are much less costly, much easier to instal and infinitely more durable.

Pedlar Culvert is made in every standard size from 8 to 72 inches diameter, of Special Billet Iron of the the best quality, in extra heavy gauge. This Billet Iron is curved into semi-cylinders—curved while cold, so the sizes never vary a fraction. These half-cylinders are then corrugated by a pressure of sixty tons to the square inch. After being corrugated, the whole surface and each edge is heavily galvanized and made positively rust-proof.



A few hours' work—no special skill needed—and an indestructible culvert is in place ready for use.

PEDLAR CULVERT

is made in Nestable Sections from the Best Billet Iron, heavily galvanized and deeply corrugated.

It is the simplest kind of work to put these half-sections of Pedlar Culvert together permanently. One half-cylinder is placed on another, and the flange-rib on each side is rigidly compressed flat by the huge pressure exerted by a simple but effective tool. No bolts, no rivets, no makeshifts—but a triple-thick locking rib-flange that gives Pedlar Culvert immense strength. Thus it will stand crushing strains that would destroy any other piping.

This peculiar flat-flange, triple-thick rib makes the most perfect joint possible—nearly as good as if it were welded. Yet it allows for expansion and contraction under heat or cold. Thus a Pedlar Culvert will not spring nor split even though frozen solidly full of ice. Also the triple rib flange principle makes it possible to break joints in putting this Culvert together, something you cannot do with any other culvert or with cement piping or tile.

Pedlar Culverts are the most portable, as well as the most durable of any piping for any purpose. Being made in half cylinders, they are nestable—so that a great many linear feet of culvert occupy but few cubic feet of car or wagon space. This economizes freight and carriage costs, and makes it easy to transport this Culvert even in rough country. You should get the free book and sample culvert that makes the whole story clear. State your possible needs when you write for the book, and let us quote prices.

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WRITE FOR DETAILS.
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Send Now For Free Book
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And Sample Culvert

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OF OSHAWA, CANADA
(Largest Sheet Metal Manufactory in the British Empire)

The Pedlar People of Oshawa
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include in the output of their immense factory the below-mentioned specialties in sheet metal building material. Samples, descriptions and prices of any of these will be readily forwarded postpaid and free upon request addressed to the Pedlar warehouse nearest to the inquirer.

Pedlar Nestable Culvert, Oshawa Steel Shingles, Steel Roofing, Corrugated Iron, Metal Shutters, Skylights, Conductor Pipes, Finials, Art Steel Ceilings, Art Steel Siding, Eave Troughs, Prepared Roofing, Metal Doors, Metal Lath, Ventilators, etc.

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to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.
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Hard Wall Plaster

HARD-WALL PLASTER HAMMER BRAND HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

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enhance the beauty of your workmanship and preserve its perfections. They wear like wrought steel and give absolute satisfaction to your clients.

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are savers of lost motion—abolish the thousand and one steps taken needlessly every day. Inter-Phones tug at the beard of old Father Time—hold him—make every hour of the day more productive—leave more minutes for work. Would you do without a 'phone in your house—or your office? Then, hadn't you better connect your departments in the same way?

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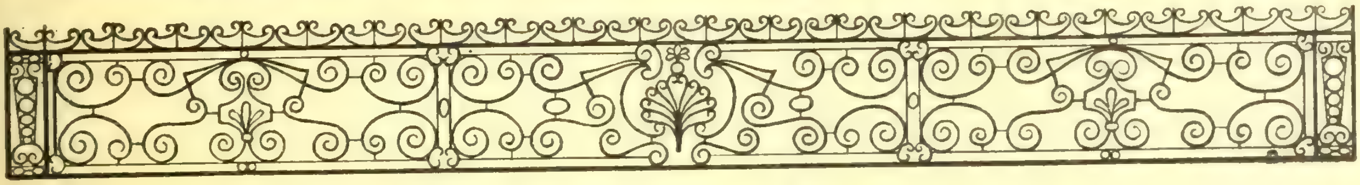

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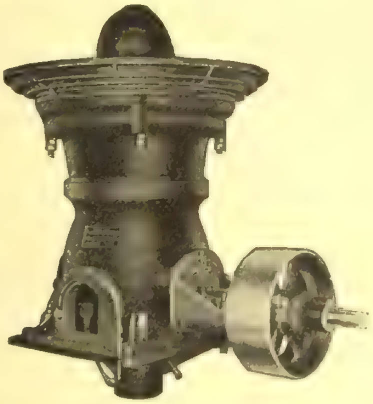

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Do you know about the famous

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Investigate a little bit. You'll find the subject interesting, and will want to know more. Begin to-day.

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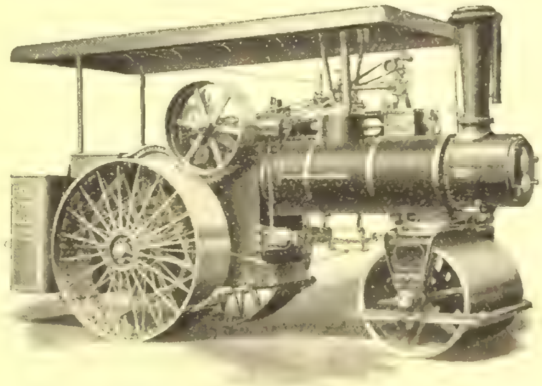

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Time price, 10-ton, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
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Ten per cent. discount for Cash.
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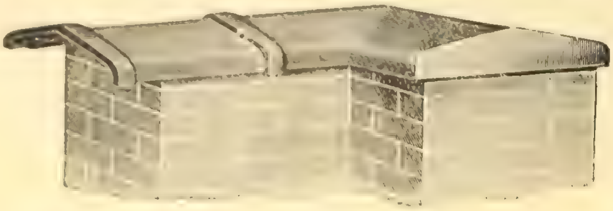

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Salt Glazed and Vitrified
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True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

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Chimney Tops
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Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

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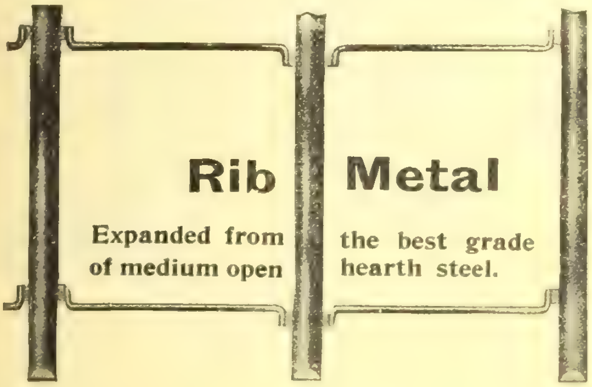
Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.



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Efficient. Easily handled.

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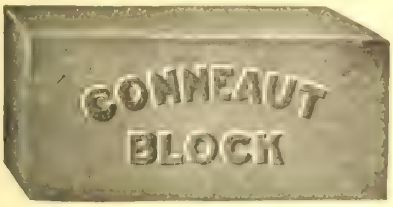

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Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

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HARDWOOD FLOORING

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Consolidated Plate Glass Co.

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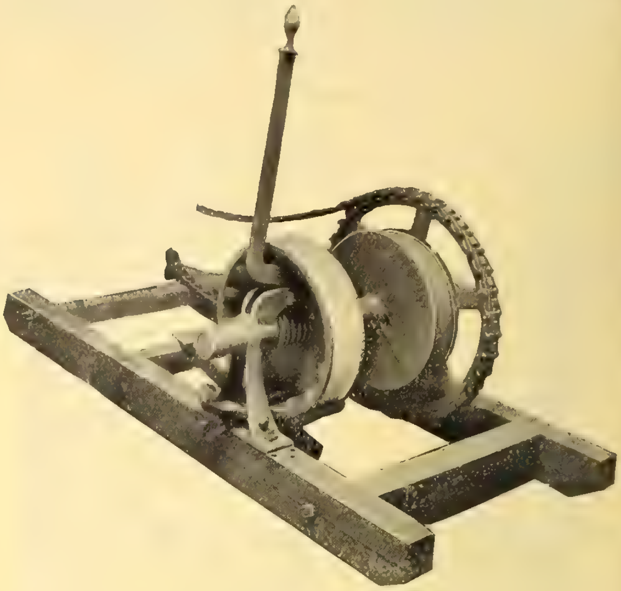
If you are investing in a hoist you can't do better than the



Patent Applied For

"London" Friction Clutch Hoist

Can be used with any make or style of gas, gasoline or oil engine. A coil spring throws the clutch out so the hoist can be operated at a distance by a rope. Write for circular.

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Cast Iron Pipe

All Sizes

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for Water, Gas, Culvert and Sewer

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All Sizes
STONE

¶ For Roadways and Sidewalks also specially adapted for

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Roman Stone
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is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

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T. A. MORRISON & CO.,
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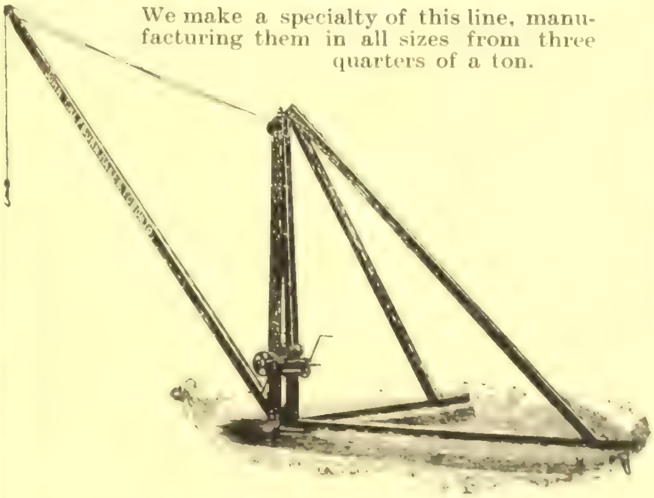
Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds
Prices on application.

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Door Making is our Specialty

We have equipped our plant with the best door machinery made, and turn out doors that are right in quality and right in price.

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The "Acorn" Exhaust Ventilator is designed on the most improved principles of ventilation.

No matter how strong the wind there is no possibility of a down draft. Instead the slightest breath of air will draw up; or exhaust, the foul air in the building.

No damper is needed with this ventilator, and it is always at work.

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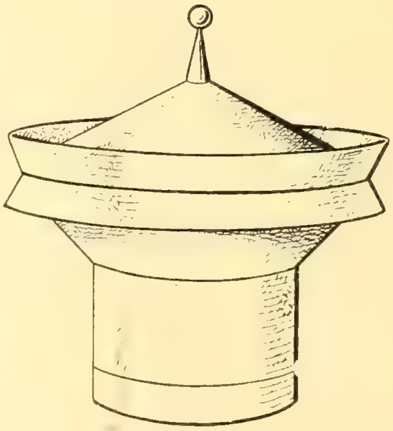
Builders and contractors who have tested the "Acorn" Exhaust Ventilator unhesitatingly recommend it. If you are not familiar with this newest and best ventilator write us for complete information. We want every builder and contractor to know all about it.

We also make several other styles of ventilators. Get our prices. They will interest you.



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Contract Record

Toronto - Canada

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Made in two sizes. No. 1 capacity 50 yds. per day; No. 2, 150 yds. per day.

WILL SAVE YOU MONEY on the first cost of machine, on cost of operation, on cost of mixing concrete.

Our Automatic Machines do **perfect measuring** and **mixing** with **any kind of material, measure any proportion,** and give **any consistency** of **moisture.** Materials only handled once. **Less men required to operate** Send for catalogue and state capacity desired.

We also manufacture a Standard Drum Batch Mixer in four sizes, 7 ft. 10 ft. 20 ft. and 30 ft. The most complete Drum Mixer out. We have everything in the line of Concrete Machinery and Cement Working Tools. Tell us your requirements

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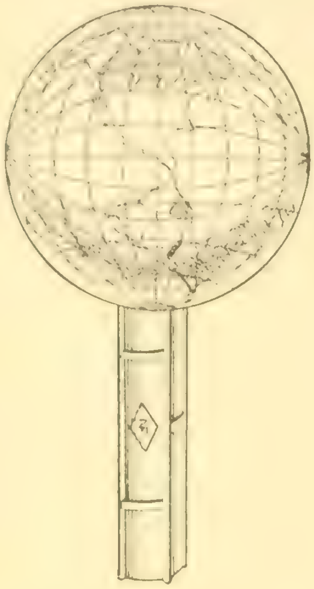

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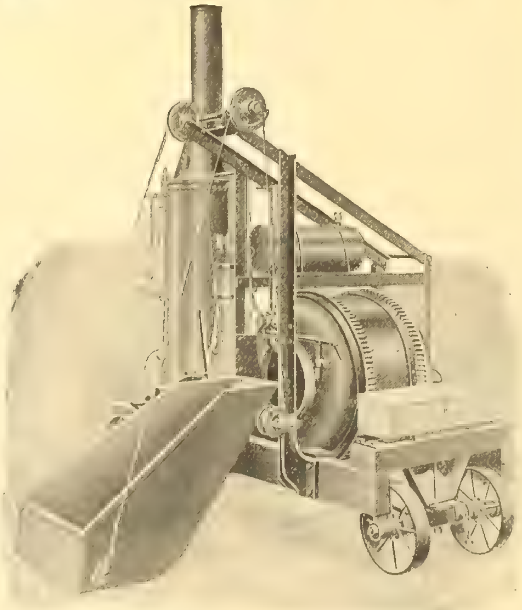

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Amherst, N.S.

The ratepayers have authorized the town council to borrow $30,000 for the purpose of extending the sewerage system of the town.

Cumberland, B.C.

Tenders addressed to A. McKinnon, city clerk, will be received until May 4th for the construction of certain works for this municipality. Plans, etc., at office of the above.

Chatham, Ont.

Tenders addressed to A. McArthur, clerk of the council, 31 King street, this city, will be received until April 27th for constructing a large outlet drainage work. Engineer's estimate (exclusive of bridges and incidental expenses), $31,400. Wm. Abraham, reeve.

Dauphin, Man.

Waterworks and sewerage by-law was passed, $175,000.

Estevan, Sask.

The 25,000 sewer by-law was carried.

Fernie, B.C.

The city clerk was instructed to secure the necessary petitions for the following money by-laws: Water extensions, $19,000; sewers, $41,000; surface drainage, $27,000; street improvements, $10,000.

Haileybury, Ont.

On May 2nd the ratepayers will vote on bylaws to issue $25,000, 30 years, 5 per cent. waterworks debentures and $10,000 15 years 5 per cent. street improvement debentures. Theo. H. Connor, Town Clerk.

Montreal, Que.

The Board of Control are considering alterations to Victoria Square with a view of improving its appearance. The plans include the installation of an artistic water basin.

Moose Jaw, Sask.

The by-law to raise $140,000 for the construction of pavements and the widening of existing sidewalks was carried.

North Vancouver, B.C.

Engineer Hane's report on sewerage was as follows: On the question of sewerage, under local improvement on the council's initiative the engineer reported as follows: Esplanade, from Forbes avenue to St. Andrew's avenue, $10,900; First street, from Forbes avenue to St. Patrick's avenue, total cost, $18,625; Second street, from Forbes avenue to [illegible] feet east of St. Andrew's avenue, total cost, $14,815; Third street, from Forbes avenue east to St. Andrew's, total cost, $21,875. The plan was figured out on a 20-year basis.

Port Hope, Ont.

On the [illegible] inst. a by-law will be voted on by the ratepayers to issue [illegible] year sidewalk and road debentures.

St. Boniface, Man.

A by-law is being prepared to submit to the ratepayers to issue $128,450 debentures for the construction of a trunk sewer.

Saskatoon, Sask.

Tenders addressed to J. H. Truesdale, city clerk, will be received until April 25th for concrete sidewalks. Plans, etc., at office of city Engineer.

Sanford, Man.

Tenders addressed to H. Griffiths, secretary-treasurer, will be received until April 27th for the grading of about 25 miles of road in the municipality of Macdonald.

Sault Ste. Marie, Ont.

Tenders are being called until May 2nd by this municipality for cement walks, etc. See advertisement in this issue.

Vancouver, B.C.

It is probable that a new sewer by-law will be submitted for about $500,000.

Victoria, B.C.

The by-law to provide for the widening of Fort street has been passed by council, and a commencement on the big undertaking will be made at an early date. It was decided that whenever any tenders were called for civic work the engineer should be asked to tender. It was resolved to call for tenders for 80 per cent. of the year's supply of beach gravel about 15,000 cubic yards), the tenders to state where the gravel comes from in order that no foreshore rights may be infringed.

Weyburn, Sask.

Tenders are still being called for water works and sewerage. See advertisement in this issue.

Westmount, Que.

The ratepayers recently approved the expenditure of $550,000 for sidewalk, roadway and other improvements.

Winnipeg, Man.

The board of control will call for tenders on the following sewers and water mains in Elmwood: Sewers—Martin avenue, $4,251; Tweed avenue, $4,983; sewer in Basswood place, $2,411; sewer in Sherbourn street, sewer in Andrews, from Burrows to Alfred, in Martin, from Watt street to C.P.R. track. Water mains on Martin avenue, $7,728; Tweed avenue, $4,[illegible].

Tenders are called for asphalting the following streets: Market street, $16,793; Salter street, $6,736; Boyd avenue, $5,976; Inkster avenue, $28,132; Aberdeen avenue, $17,700; Florence avenue, $14,685.

AWARDED.

Hamilton, Ont.

[illegible] street, from Francis street to Mars avenue, at $1.09 per foot.

London, Ont.

[illegible] don; C. F. Gillam that for grading at 95 [illegible]

Mimico, Ont.

[illegible] given the contract at $2,495 for the construction of a pipe sewer connecting the Victoria Industrial School with the new sewerage system of New Toronto. J. A. L. Macpherson, engineer in charge.

Ottawa, Ont.

John Lowry, of Ottawa, has the contract for the construction of a protection pier at Winnipeg Beach, Man.

Toronto, Ont.

The J. H. McKnight Construction Company were awarded the contract for laying and jointing cast iron water mains up to a diameter of 12 inches, the contract to expire on December 31st. The contract price is $51,845. Other bids were: $53,050, $56,032, $61,327, $62,393, $67,558. Somerville, Limited, were given the order for brass curb cocks required by the waterworks department, at the following prices each: 1-2 inch, 53 cents; 5-8 inch, 73 cents; 3-4 inch, 93 cents; 1 inch, $1.41. Excelsior Construction Company will construct a sewer on Salem avenue for $243. Highest bid was $315.

Railroads, Bridges and Wharves

Brandon, Man.

This city will have a transfer railway connecting the three big systems which have line here and another industrial track built by the C. N. R., which will open an avenue of commerce through the central part of the city, providing sites for warehouses and manufacturies. H. Brown city clerk; G. E. Shaw, traffic manager, C. N. R.

Chatham, N.B.

Tenders will be called shortly for building I. C. R. Chatham division.

Fort William, Ont.

C. P. R. has given the contract for the changing of the piers at the Gravel River bridge to Stewart & Hewitson, who are considering the proposition.

Moncton, N.B.

McDougall's bridge below the dam, being constructed by the Shediac Electric Electric Light Company, was carried away.

Montreal Que.

The G. T. R. is calling for tenders for 500 special automobile cars. Over $3,000,000 of freight equipment, is is stated, will be required, such as 2,500 steel frame box cars of 100,000 pounds capacity.

New Liskeard, Ont.

Tenders addressed to E. F. Stephenson, clerk, will be received until the 25th inst. for erection of bridge, 75 feet length, work to be completed by June next. Plans at Speaker office.

Niagara Falls, Ont.

G. F. Hanning and staff have completed the survey of the C. N. R. [illegible]. The Niagara, St. Catharines & Toronto [illegible], owned by [illegible] & Mann interests, will build a line to Fort Erie during the coming summer, forming a belt line through [illegible] and a feeder for the C. N. R.

Ottawa, Ont.

The bill to incorporate the Ottawa, Rideau Valley and Brockville Railway Company has been passed. Promoters:—Alfred McDougall and Robert E. Elliott, of Montreal, and others.

The C. P. R. roundhouse was damaged to the extent of about $12,000 on the 12th inst.

The bill respecting the Kingston, Smith's Falls & Ottawa Railway, as amended, carried in the Railway Committee of the Commons. The amendment provides that the road must be started within three years.

Phoenix, B.C.

It is announced that contract for construction of a ten miles extension of the Kettle Valley Lines Railway has been awarded to W. P. Tierney & Company, railway contractors. Work on the extension will commence in the course of a month.

Quebec, Que.

Tenders for the construction of the Quebec bridge, it is stated, are to be invited next month.

Tenders are being called by the Department of Railways and Canals for the erection of a boarding house at the site of the Quebec bridge. Plans, etc., at office of J. H. Paquet, 105 Dalhousie street.

St. Charles de Caplan, Que.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, will be received until May 13th for the construction of an extension to the wharf here. Plans, etc., at above department, and at office of A. R. Decary, district engineer, Quebec, and on application to local postmaster.

Union Bay, B.C.

The clearing of the right of way for that branch of the proposed east coast extension of the E. & N. Railway, lying between Oyster River and this place will be under way shortly. H. E. Beasley, superintendent of the road, announced that tenders for the work would be invited immediately.

Vancouver, B.C.

The presentation of plans for the proposed new bridges over the Great Northern Railway cut at Victoria and Park drives are under consideration and call for 30 and 42 foot width respectively, with 26 foot walks on each. Both bridges will be of steel of the deck design and will cost approximately $18,000 to $20,000. Assistant Chief Engineer, G. N. R., Stewart. Clements, city engineer.

Winnipeg, Man.

Bids are wanted for heavy trestle work and pile driving. Apply by letter to P. O. Box 1678, Winnipeg.

Plans for the McPhillips street subway have been completed by the C. P. R. and work will start at once.

AWARDED.

Hickson, Ont.

James Anderson, clerk, East Zorra, sends us the list of tenders for bridge: A. Hill & Company, Mitchell P. O., $1,750; R. McManners & Company, Hamilton, $1,925; Western Bridge Company, Chatham, $1,575; Petrolea Bridge Company, Petrolea, $1,750; Dickson Bridge Company, Campbellford, $1,549; Hunter Bridge Company, Kincardine, $1,1550; Fraser & Clemens, N. Hamburg, concrete arch only, $2,300; Bezley Bros., Woodstock, abutments, per cubic yard, $5.09; H. S. Dibble, Hickson, abutments, per cubic yard, $6.50; Hamilton Bridge Company, abutments and bridge, complete (accepted), $2,029. The first six were for bridge complete.

Lindsay, Ont.

J. R. McNeillie, clerk, sends us the following list of tenders for Little Bob Bridge, Bobcaygeon, Ont.:— Two steel spans, including metallic reinforcement for concrete floors—Western Bridge & Equipment Company, Chatham, $2,075; The Jenks-Dresser Company, Sarnia, $2,150; the Hunter Bridge & Boiler Company, Kincardine, $2,700; R. Macmanus Company, Hamilton, $2,375; the Dickson Bridge Works Company, Campbellford, $2,048; the Hamilton Bridge Works Company, Hamilton, $1,840. The tender of the Hamilton Bridge Works Company was accepted with additions, as follows: Two spans, $1,736; channel curbs, $90; steel aprons, $60; concrete floors, $504; approach railings, 40 running feet, $40; railings on each side of centre fill, 200 running feet, $200; total, $2,630.

Port Stanley, Ont.

The contract for the dock for the new boat to Cleveland has been awarded. Work will be commenced immediately, will cost about $10,000.

John McGugan, of Payne's Mills, has secured the contract for building the 250 feet of dock for the Southwestern Traction Company.

Woburn, Ont.

Rutherford & Patten were awarded contract for construction of reinforced concrete arch bridge over the River Rouge, $3,600, by the Scarboro Township Council. Other tenders were: Horace Thompson, $4,600; McManus & Company, $5,520; Rutherford & Patten, $3,600; B. W. Hyde, $10,495; E. J. C. Elliott, $4,690, and J. A. Watson, $5,510. Prices do not include cement and engineering costs.

Winnipeg, Man.

It is stated that contracts have been awarded by R. J. Mackenzie for extensions of the Canadian Northern in Saskatchewan and Alberta totalling 230 miles, thus:—Half of the contract on the Maryfield extension to the Cowan Construction Company, the balance of the work at the Maryfield extension to the Northern Construction Company.

Public Buildings, Churches, Schools, etc.

Brantford, Ont.

St. James Church will consider the removal of church this year.

Tenders are being called until April 27 for extensions to King Edward and Ryerson Public Schools. Geo. W. Ball, architect. See advertisement in this issue.

The public school board authorized the calling for tenders for the new school additions.

Barrie, Ont.

St. Mary's Church are considering the improving of the Deanery.

Brandon, Man.

W. A. Elliott who built the fire hall at Moose Jaw, estimated the cost of an efficient onet here at $20,000. It is possible that something definite may be done at council.

Carleton Place, Ont.

The building of a public hospital for the town has been publicly endorsed, estimated cost, $25,000.

Estevan, Sask.

The $10,000 by-law to complete town hall was carried.

Edmonton, Alta.

The exhibition directors are calling for tenders for the erection of the following buildings: Stables for horses, sheep, cattle, swine, and a cottage for the resident superintendent.

The Public Works Department are calling for tenders for conduit wire, supply of wood fibre plaster and maple flooring for Ponoka Asylum, tenders to be in by April 23rd.

Fernie, B.C.

A $7,000 by-law for school improvements will probably be submitted.

Fort William, Ont.

A site has been purchased for the new Y. M. C. A. near Syndicate avenue, 100 feet frontage. General secretary, G. H. Williamson.

Flesherton, Ont.

Tenders are being called until April 28th for erection of 6-room school. See advertisement in this issue.

Fredericton, N.B.

Tenders addressed to J. D. McLean, Department of Indian Affairs, Ottawa, Ont., will be received until April 30th for the erection of frame school houses for Woodstock, Oromocto and Burnt Church Indian reserves, N.B. Plans at post offices at Chathom, Newcastle, Woodstock and this city.

Galt, Ont.

It is stated that the theatre that was recently destroyed by fire will be rebuilt but on another site.

Grimsby, Ont.

Tenders addressed to H. N. Grout, secretary-treasurer of Education, Grimsby will be received until May 30th for the various trades required in the erection of a high school. Plans, etc., at offices of architects, Munro & Mead, Hamilton, and also at office of W. W. Kidd, this place.

Hamilton, Ont.

Controller Cooper has announced that the registry office would cost $39,000, leaving a balance of $700 for sundries. Noted in issue of April 6th.

Haileybury, Ont.

The Anglican congregation will build a parish hall, $10,000.

Halifax, N.S.

It is reported that the Home of the Guardian Angel, N. W. Arms, will be begun this summer. St. Edwards Catholic Church, for which lots on Coburg road have been purchased, will not be begun until the Guardian Angel Home building is finished.

The building committee of the Halifax Y. M. C. A. have decided to ask for new tenders for the construction of their Y. M. C. A. Building. The general plans will be adhered to but Ross & Macfarlane, the Montreal architects, will be asked to amend the specifications to reduce the cost of this building.

Kildonan, Man.

On April 30th the ratepayers will vote on the $11,000 school bylaw.

Kenora, Ont.

Department of Militia have decided to erect a drill hall here on a portion of the town park east of the Central School. It is quite likely that work will be commenced on the building this summer.

Lockport, N.S.

Consul Alfred J. Fleming reports that the plans have been matured for the cold storage plant to be built here and to cost $85,000. It will have the most modern equipment. The glue plant, which receives no Government aid, will have a capacity of 50,000 tons annually.

Ladysmith, B.C.

Tenders will shortly be called for hospital, for which $10,500 is available in cash.

London, Ont.

At a meeting of the Board of Governors of the Western University, a committee was appointed to investigate the question of sites. Secretary Baker.

The school board have recommended that $5,000 be spent on enlarging No. 22 Hamilton road east school. Mr. Duncan, principal; R. Saunders, chairman.

Lethbridge, Alta.

The Trades and Labor Council will have a 2 storey building erected, 50 x 125 feet. cost, $75,000.

Medicine Hat, Alta.

A new school is to be built at Finnis Lake. Jas. Plumley, secretary, 602 Esplanade.

Montreal, Que.

Plans have been submitted by Building Inspector Chausse for the enlarging of City Hall by the erection of an annex, cost about $175,000.

Plans for public underground lavatories, prepared by Mr. Howard, of the city surveyor's department, have been laid before the Board of Control. Cost $6,500 each.

The Board of Governors of the Institute des Petites Filles de St. Joseph have decided to erect a school building on Sherbrooke street near Atwater avenue. Estimated cost $100,000.

No awards have yet been awarded in connection with the additional wing to be added to the new Medical Building, McGill University, but the matter is still under advisement. Brown & Vallance, architects, Canada Life Building.

A movement is on foot to raise money for the purpose of building a gymnasium building for McGill University; estimated cost, $250,000.

It is stated that the Y. W. C. A. are considering the inauguration of a campaign to raise $100,000 to be used in the erection of an eight storey extension to the Dorchester Building.

The Cote St. Paul Academy for Boys, managed by the Christian Brothers was burned to the ground on the 16th inst. Loss about $35,000.

North Portal, Sask.

Construction will shortly commence on the immigration and detention building, 75 x 37 feet, on a site opposite Canadian Customs. J. Bruce Walker, Commissioner of Immigration, Winnipeg, Man., C. W. Speers, Canadian Colonization Agent.

New Westminster, B.C.

The plans for the new Royal Columbian Hospital, to be built by the Provincial Government have been approved by the board of directors of the institution. The structure will cost $75,000. It will be built of red brick and stone, with slate roofs, the entire edifice being fireproof. Plans were submitted in competition and were adjudicated upon by [illegible], local architect. Construction work will commence immediately.

Ottawa, Ont.

Mayor Hopewell has stated that the contract for the installation of the civic incinerator would likely be let shortly, and that the plant here will be fashioned after that at Seattle, Wash.

Crawford Ross, secretary-treasurer of the school board, is calling for tenders until April 26th for the erection and completion of two new schools on Hopewell and Breeze Hill avenues. Plans at office of W. B. Garvock, superintendent of buildings, Creighton Street School.

Tenders will be received until April 21st by John Henderson, city clerk, for alterations to the City Hall. Plans, etc., at office of the architect, C. P. Meredith, 126 Sparks street.

Port Arthur, Ont.

Out of over thirty designs submitted by architects residing in the principal Canadian cities for Carnegie library, the design of Hood & Scott, of this city, was awarded the first premium.

Quebec, Que.

The sum of $15,000 was voted in the House of Commons for the extension of the Quebec Drill Hall.

Regina, Sask.

It is stated that the board of governors of Saskatchewan University have accepted the tender of Smith Bros. and Wilson for the buildings.

Revelstoke, B.C.

$30,000 have been voted for the erection of a new 8 roomed school on Sixth street, southeast corner of the city. A by-law for the purchase of a block opposite the present school in the centre of the city was defeated.

St. Eustache, Que.

Fire destroyed the Protestant church and about sixteen houses on the 17th inst. Total estimated damage, $40,000.

Thorold, Ont.

The ratepayers voted in favor of asking for a grant of $10,000 from the Carnegie fund for libraries. Mayor McCullogh.

Sydney, N.S.W.

Competitive designs are being called for, in which city designers all over the world are free to compete, for the federal capital at Yass-Canberra in New South Wales; competitions to be open for 12 months. The Minister, Hon. G. W. Fuller, has not yet fixed the amount of the prize money to be offered, but it is reported that he is anxious that it should be a sum large enough to attract the best talent in the world. Panoramic views of the federal territory, together with details of its geological features, climate, etc., will be supplied in order to assist the competitors in getting out their designs.

Toronto, Ont.

Tenders addressed to A. W. Holmes, architect, 10 Bloor street east, will be received until April 27th for masonry, etc., required in the erection of St. Augustine's Seminary. See advertisement in this issue.

The Northern Congregational Church members have decided to sell their present property.

At a meeting of the Anglican Church of St. Mary the Virgin, corner of Bloor street and Delaware avenue, plans for a new church were favorably considered.

The congregation of St. Stephen's Anglican Church, corner of Bellevue avenue and College street, are to have a new building erected.

Tenders will be called about May [illegible], for a new residence for Victoria College. Sproatt & Rolph, [illegible] street.

The members of St. Martin's Church have decided to erect a new edifice. Rector, Rev. S. de K. Sweatman.

It is stated that the Friends' Association are considering the establishment of an institution to be used as headquarters for their general work. President, W. G. Brown; secretary, Miss Mary Youmans.

The Toronto Arena Company, Limited, has secured incorporation, capital $250,000; provisional directors, Irving Wells Smith, insurance agent; E. G. Long and A. Mearns, both of Toronto.

Building permits have been issued to St. Paul's Church, near Church street, on Bloor east, $265,000; Dovercourt Presbyterian Church, 2 storey brick school, corner Dovercourt and Hepbourne, $20,000; Lourdes Roman Catholic Church, 2 storey brick presbytery, near Sherbourne, on Earl, $10,000.

Vancouver, B.C.

Mayor Taylor and Messrs. G. H. Healey and F. C. Wade have settled all matters regarding Detention Home except that of a site. Capt. Collier, of Salvation Army, probable detention officer.

N. A. Leach, school architect, has prepared plans for the three new schools, each at a cost of $45,000.

The Mount Pleasant Conservative Club have under discussion the erection of handsome quarters.

Messrs. Pervey and Alexander have prepared plans for the new St. James Church. Church committee, Messrs. Taylor, Coles, Peake, etc. Estimated cost, $100,000.

Tenders have been called for removal of Grace Methodist Church and the putting in of full size basement under the same. Plans, etc., at Mr. T. M. Howe's, 6 Fourteenth avenue east.

A committee was appointed by St. Mark's parish to secure plans for a new church. J. L. Duncan, church treasurer.

The time for receiving tenders for construction of two fire halls has been extended until the 21st inst.

The Dominion Government has authorized the lease of admiralty site for Isolation Hospital.

Victoria, B.C.

The Dominion Trust Company has instructed its architect, H. S. Griffiths, to prepare plans for an eight storey block of white stone, cost over $100,000, on Wharf street, fronting on the inner harbor. The two lower floors, and perhaps a third, are to be devoted to the use of the J. B. A. A. Work will start as soon as possible.

The necessity of a new Christ Church cathedral is felt, and it is thought that something will be done when the new rector, Rev. J. A. Doull, assumes charge in May. Architect, Mr. Keith.

Woodstock, Ont.

The council have authorized the town solicitor to prepare a by-law to raise $10,000 debentures for the new Beale street school.

Westboro, Ont.

A new $15,000 school is to be erected here.

Welland, Ont.

The Collegiate Institute Board may submit a by-law to the ratepayers to provide funds for a new assembly hall and gymnasium.

The Welland Presbyterian Church will spend $10,000 in improvements this year.

Windsor, Ont.

Tenders addressed to N. Tessier, secretary, Department of Public Works, Ottawa, will be received until April 25th for interior fittings for the post office here. Plans, etc., on application to W. Curtis, caretaker, Public Building, this city, or to [illegible], clerk of works, postal sta tion "F." Toronto, and of the above mentioned Department.

Winnipeg, Man.

Plans are proposed for a big curling rink for the Thistle and Builders' Exchange Club.

Westminster Church will start their building, corner Maryland and Buell streets, this year. J. M. Mitchell is interested.

The Presbytery Board authorized the expenditure of $25,000 for a new Presbyterian Mission church on Dufferin avenue.

Knox Church have a scheme, embracing new church buildings to cost $200,000, to be erected within the next two years.

New Rifle ranges, barracks and permanent camp buildings will be erected by the Dominion Government.

J. H. G. Russell has been selected as the local architect for the new Y. M. C. A. Noted in last issue.

Permit has been issued for a new church for the Swedish Lutheran congregation, $30,000. Pender street east.

Preliminary sketches of a north end branch of the Y. M. C. A. are being considered.

The building committee's recommendation for the erection of two collegiates was passed. Estimated expenditure $225,000.

Building permit has been issued to Orpheum Theatre Company, threatre, east side of Fort street, between Portage and Graham avenues, $175,000.

Excavation work has been started at the site of the $75,000 Christian Science Church to be built on the corner of River avenue and Nassau streets. Wallace & Aikins have the contract and Jordan & Over are preparing the plans.

Building permit was issued to Lindsay A. Wardell, brick church on the corner of Dundurn and Marguerite streets for the Roman Catholic corporation, $8,000.

AWARDED.

Fort William, Ont.

The contract for altering St. Luke's was awarded to George Read. Cost, $5,000.

Hamilton, Ont.

James Bain & Son, iron work at police station, $995.

Lethbridge, Alta.

Contract for the erection of the new immigration building has been let to Smith Bros & Wilson.

Montreal, Que.

The general contract for the erection of the Alexandria Street School for the Board of Protestant School Commissioners has been awarded to Byers & Anglin. A. F. Dunlop, architect, Lindsay Building. Estimated cost, $130,000.

Peterborough, Ont.

Mr. MacGregor's tender was accepted for the heating of the county buildings in town.

Regina, Sask.

Smith Bros. & Wilson have secured the contract for the erection of the new convent school to be erected here for the Order of Our Lady of the Missions, $30,000. W. W. Hilton, architect.

Starbuck, Man.

Contract for the school here has been let to G. Johnston for all but heating, which is not let. E. D. Tuttle, architect, 204 Bannatyne avenue, Winnipeg, Man.

Toronto, Ont.

The Toronto Furnace & Crematory Company will install the steam heating plant in St. Lawrence Hall for $907, the lowest tender submitted. Bids ranged from $907 to $998.

Victoria, B.C.

The contract for supplying the Province of British Columbia with several thousand school desks of various heights, to meet requirements of the current year has been awarded to E. G. Parnell & Company, of Vancouver, at $5,200.

Winnipeg, Man.

The contract for the alterations of Riverview Presbyterian Church were awarded to J. Morrison, $2,600.

A contract was awarded to the Munroe Steel & Iron Works for the construction of an iron fence for Machray School site at an estimate cost of $647. The tender of Thomson & Homer, at $11,300, for the heating and ventilating plant in the Lord Roberts School was accepted, system of temperature control optional.

Residences

Arcola, Sask.

The town council are considering the building of 25 houses, the town to guarantee the builder 10 per cent.

Little Britain, Ont.

Tenders are being called until April 20th by G. W. Hall, Box 204, for the erection of a brick parsonage, also frame stable.

Montreal, Que.

Tenders will be called for on or about April 31st, 1910, for 12 semi-detached villas to be erected in Outremont. Jas. E. Adamson, architect.

Tenders have been received for the erection of a residence on Ontario avenue. Hogle & Davis, arcihtects, 85 St. Francois Xavier street.

Plans and specifications are being prepared for two cottages to be erected on Westmount avenue and for two cottages on Belmont avenue for J. H. Hand. Wright & Son, architects, 204 St. James street.

Plans and specifications are being prepared by Wright & Son, architects, for a large modern apartment house to be erected on St. Matthew street for a Montreal building syndicate. This building is to be practically fireproof throughout.

Tenders will be received until April 22 for the erection of a residence on Belvidere road, Westmount for Mr. Lionel J. Smith. Hutchison, Wood & Miller, architects, Royal Insurance Building.

Tenders for the erection of a residence on Sydenham avenue, Westmount, for Mr. F. Macfarlane will be received up till April 21st. Hutchison, Wood & Miller, architects.

Jos. Sawyer, architect, 407 Guy street, is preparing plans for an apartment house on Mountain street.

The Duluth rink with the property on which it is situated, has been sold to Ald. N. Leclaire, who will erect forty-five flats on the southwest corner of Duluth and St. Urban streets.

Ottawa, Ont.

A building permit has been taken by F. L. Campbell for an apartment house, $10,000.

Recent building permits include:—J. A. Grierson, 4 brick veneer houses on Preston street, $6,000; William Weston, double brick veneer house, Percy street, $2,500; C. H. Stata, 4 brick veneer dwellings, Fourth avenue, $13,400 for four; A. Gougoon, alterations to 4 dwellings, LeBreton street, $2,000; D. O'Byrne, brick veneer dwelling, Gladstone avenue, $3,500; C. P. Meredith, brick dwelling, Laurier avenue east, $8,000; Geo. Crain, alterations to shop and apartments, Nepean street, $3,500; Charles Hopewell, solid brick factory, Lyon street, $10,000; Mrs. Louisa Blais, double brick veneer dwelling, Clarence street, $3,000; P. Hanrahan, brick veneer dwelling, College avenue, $2,500; James Moir, brick veneer dwelling, Centre street, $3,000;; C. A. Douglas, solid brick double house, Laurier west, $5,000, double brick veneer dwelling, Gloucester street, 4$,000; R. H. Miller and J. Brisson, solid brick shop and offices, Albert street, $11,000; R. A. Nesbitt, double brick veneer, dwelling, Arlington avenue, $3,500; Alfred Day, double brick veneer dwelling, Third avenue, $3,500; E. J. Marion, brick veneer dwelling, Riverdale avenue, $2,000; Abraham Payne, brick veneer dwelling, Preston street, $2,000; Thos. Clarey, double solid brick dwelling, Centre street, $4,500; J. A. Bowman, brick veneer dwelling, Percy street, $2,500.

Regina, Sask.

McCallum, Hill & Company propose to erect twenty houses in this city.

J. B. Shaw will start the erection of an apartment building at once. Storey & Van Egmond, architects.

Saskatoon, Sask.

Storey & Van Egmond are preparing plans for residences for J. R. Bunn, of Milestone, and Geo. McCraney, M.P., of Rosthern.

Vancouver, B.C.

Permits for apartment houses were obtained as follows. Florence Wheeler, Eveleigh street, $14,500; J. H. Bartholomew 1455 Eighth avenue west, $35,000; C Tweedale, 343 Hastings street east, $26,000.

Plans have been prepared by Paul M Clemens, 219 McDermott avenue, for Albert Johnson for the 3 storey and basement apartment block on Furby street Excavation has been started. Estimated expenditure, $45,000.

Winnipeg, Man.

Building permits have been issued fo apartment blocks to Watson & Simmers corner of Spence and Balmoral place $100,000, C. S| Bridgman, architect; A Johnson, Sargent and Notre Dame streets $45,000; H. Peterson, Portage and Ellic avenues, $28,000. Also residence, C. S Simpson, Ruskin road, $22,000.

Tenders addressed to W. Bruce, architect, will be received until April 21st fo erection of residence, Ashburn street, fo J. R. McKenzie. Plans at office of th above, 222 McDermot avenue.

K. B. Skagford is planning to construc thirty residences in Norwood this summer The houses will cost in the neighborhoo of $60,000.

J. T. Bergmann will build a residenc costing about $4,600. P. M. Clemens, architect.

T. C. Keenleyside has sold the south west corner of Hugo and Fleet streets t a local contractor, who will put up te modern houses this year.

Patrick Callaghan has purchased tw lots on Bannerman avenue on which h will build at once.

Sir Daniel McMillan will build a residence corner Kinksway and Wellingto crescent costing $48,000.

F. T. W. Alexander has purchased building site on Wellington crescent.

Recent building permits include:—W Crowe & Sons, house, north side Merrion

$3,200; J. W. Parker, house, north side Beresford, $2,000; W. J. McLaughlin, one house, east side of Arlington, $4,000; Henderson Bros. & Cohen, house, west side Home, $2,100; A. H. Fraser, house, north side Jubilee, between Helen and John, $3,500; S. E. Hart, west side Hargrave, house, $5,000; A. Galbraith, house, west side Banning, $5,000; R. G. Mainland, house, west side Stiles, $2,000; A. W. Trickey, house, north side McAdam, $3,000; J. F. Kemp, house, west side Lipton, between Portage and Livinia, $2,000.

AWARDED.

Montreal, Que.

The contract for all trades in connection with alterations to a residence on St. Famille street for Dr. England, has been awarded to William Evely, carpenter and joiner, 449 Bleury street. MacVicar & Heriot, architects, 104 Union avenue.

The contract has been awarded to John Allan, general contractor, 300 Atwater avenue, for alterations to summer residence of Mr. Holt, Lakeside, Que. Peden & McLaren, architects, 20 St. Alexis street.

General contract for residence to be erected for Ernest Latter, Esq., on Cote St. Luc road, Montreal, has been awarded to F. M. Hartman, Southam Building, corner Guy street, Montreal. Jas. E. Adamson, architect, Montreal.

General contract for two semi-detached villas to be erected on west side of Rockland avenue, Outremont, Que., for J. F. McLean, Esq., has been awarded to Sparrow & McNeil, Coristine Building. Jas. E. Adamson, architect, Coristine Building, Montreal.

Business Buildings and Industrial Plants

Brandon, Man.

Plans are being prepared for another hotel for Jas. McLeod, owner of the Royal.

The contract for the two new storeys to be added to the Empire hotel will be let shortly. E. J. Peltier, owner; A. A. Evans, lessee.

Plans prepared by F. R. Evans, 166 Pacific avenue, Winnipeg, for a 5 storey office building of reinforced concrete, brick and stone, 60 feet on Rosser, 75 feet on Ninth street, call for an expenditure of about $65,000. Tenders for construction will be called shortly.

It is stated that Clement Bros. will erect another business block on property [illegible] of Bank of Montreal; dimensions, frontage, 50 feet by 68 feet depth, 3 [illegible].

The two extensions to the Brandon hardware block have been decided upon. Estimated cost, about $81,000. J. B. Curran, manager. E. W. Durst, contractor; W. S. Richards, supervisor of construction. It is stated that [illegible] will build a three storey block between 11th and [illegible] streets.

Calgary, Alta.

The Calgary Milling Company's [illegible] was destroyed by fire on the 11th inst. Total estimated loss, $300,000. It is stated that the company will rebuild at once.

Daysland, Alta.

The following will build: [illegible]

Edmonton, Alta.

J. Hutchins, of Great West Saddlery Company, Winnipeg, has considered plans for the erection of the large factory and warehouse to be erected here next year.

Forward, Sask.

It is understood that Wm. A. Nichol & Company have decided to erect in the immediate future a hotel, $7,000.

Fort William, Ont.

The Northern Automobile Company, capital $100,000, held its annual meeting on the 11th inst. Tenders have been called for the new garage, which is expected to be completed by July. President, A. Sellers; secretary-treasurer, N. M. Patterson.

Hawkestone, Ont.

The store of Leigh Bros. was destroyed by fire on the 15th inst. Total loss, about $7,000.

Lethbridge, Alta.

J. W. Turpin will have a large business block erected here. Hayr Bros. will also have a business block put up this spring.

McAdam Junction, N.B.

Extensive improvements are to be made to C. P. R. station here.

Moose Jaw, Sask.

Corner of River street and Ninth avenue is being demolished to make way for the erection of Hopkins & Lathan's new building.

Montreal, Que.

The sash and door factory of H. Fauteau, Fauteau avenue, was damaged to the extent of about $9,000 on the 16th inst.

The property, corner of Craig street and St. George streets, it is stated, has been purchased by L. Cohen & Company as a site in the future for an 8 storey building.

It is stated that a new company has been formed to merge Freemans, Limited, and the St. Regis Hotel Company for the purpose of forming a chain of restaurants similar to those operated in the United States by the Childs Company. The capital of the new company will be larger than the two hotel companies. It is the intention of the new company to secure the property and buildings now occupied by Freemans, Limited, on St. James street, and extend the facilities of the present restaurant.

Plans and specifications have been prepared by T. Pringle & Son, Limited, architects, Coristine Building, for extensions to the Toronto warehouse building of the Canadian Rubber Company of Montreal, Limited.

The extensive additions to the Molson Brewery premises on Notre Dame street east, by the erection of a cold storage plant, mentioned in the "Contract Record" of February 16th, are held in abeyance pending the passing of a bill by the Quebec Legislature, that will give the Molson Company power to expropriate the land that is required for this extension. As the matter stands now the city has the right to extend Papineau avenue from Notre Dame street to the C. P. R. tracks and should this be done it would cut into the property on which the firm purposes to erect their plant.

Plans for the new buildings for Montreal Street Railway are being prepared and the architects, Marchand & Haskell, expect to call for tenders shortly.

Selected bids are being received for the construction of the new office and factory building for the Holland Varnish Company. T. Pringle & Son, architects, Coristine Building.

Oxford, N.S.

[illegible] Company, Limited, [illegible]

foundation of a fine up-to-date office building, 28 x 46 feet.

Orillia, Ont.

It is stated that T. A. Main will construct a large new block on Main street, $20,000, and also that J. B. Tudhope, president Carriage Factories, Limited, has asked for about 75 houses for his employees, work for which will be in the hands of local builders.

Ottawa, Ont.

Tenders addressed to P. E. Ryan, secretary, Commissioners of the Transcontinental Railway, Ottawa, will be received until May 2nd for the construction and erection of a station building at Lake Superior Junction, Ont. Plans, etc., at office of G. Grant, chief engineer, and S. R. Poulin, district engineer, St. Boniface, Man.

Quebec, Que.

The Crown Rubber Shoe Company is planning to start a factory in Limoilou.

The following building permits have been issued recently: S. Savard, proprietor, M. Leclerc, contractor, erection of building on Demers street, $10,000; J. A. Bouchard, proprietor, Ed. Bouchard, contractor, erection of brick building on Caron and Queen ssreets, $10,000.

The erection of an eight storey building, cost $200,000, will be built by the Quebec Railway, Light, Heat & Power Company on the site recently purchased by the company. Mr. C. A. E. Carr, general manager of the company, accompanied by Mr. R. P. Lemay, architect, will at once leave for New York, where they will inspect some of the large buildings in that city. It is hoped to begin active work next May. The building will be one of the most imposing and up-to-date structures in the city. Directors, R. Forget, Senator Mackay and others. Noted in issue of March 9th.

Regina, Sask.

The B. F. Nelson Manufacturing Company, of Minneapolis, will likely erect a warehouse or factory here.

Geo. R. Rastall, of the Brush & Overland Company, states his company will build an automobile factory here.

H. J. Hardie, of the Toronto Type Foundry, states his company will erect warehouse and office building here this year.

The Bank of Commerce will have a stone building erected.

Smith Falls Ont.

Tnders were called until April 20th for the various trades required in the erection of warehouse and office building corner of Herbert and Elizabeth streets for Robertson, Nicolle & Company. Arthur Ellis, architect, Kingston.

Saskatoon, Sask.

The Royal Bank have purchased a building site.

Mason Bros., proprietors Royal Hotel, are to build a new hotel of 50 rooms. C. T. Stacey, of the Western Hotel, will also build. The Flanagan Hotel will also probably be extended.

The Saskatchewan Cartage & Warehouse Company contemplate the erection of another building.

Stewart, B.C.

It is reported that J. H. Houston and [illegible] tion, with the idea of erecting large [illegible]

South Bay, N.B.

The [illegible] Company, [illegible]

Limited, formerly of Hampton, capital $[illegible], will establish a factory here.

Tillsonburg, Ont.

Premises occupied by W. C. Burns and [illegible] Company's agency, were destroyed by fire on the 17th inst. Total estimated loss, $[illegible].

Toronto, Ont.

A building permit has been issued to [illegible] for 3 storey brick warehouse, [illegible] King street west, $[illegible].

The foundry of Reid & Brown was badly damaged on the 17th inst. Total estimated damage, $10,000.

Vancouver B.C.

A building permit has been issued for the new mill at the foot of Birch street for Mr. John Hanbury. Cost, $80,000.

A permit has been taken out by the Metropolitan Building Company for a 10 storey brick and stone building on Hastings street west. Architect, H. S. Helyer, [illegible] Hastings street; superintendent of construction, W. W. Parson, $400,000.

It is stated that the city and G. N. R. have reached an agreement re the terminal station, which will be used by N. P., G. T. P., and C. N. R. also. Work is to start within 90 days after plans have been approved, and completed in 5 years. Total cost, estimated, $1,500,000. Matter to be finally approved by electorate, to whom it will be submitted in about 6 weeks.

Victoria, B.C.

H. S. Griffiths has prepared plans for the 3 storey building to be erected for Sweeney & McConnell, quality printers, Langley street.

A building permit has been issued to the Westholme Lumber Company for their warehouse on Government street, $44,000.

Plans have been approved for the extension of the shirt and overall factory, Wharf street, managed by Turner Beeton Company. Tenders are being invited by the architect, W. Ridgway Wilson, for the construction of an addition to the present factory, situated on the corner of Wharf and Baston streets.

Woodstock, N.B.

The site for the new C. P. R. station has been purchased adjoining Connell's foundry. Estimated expenditure, including other projects, $100,000.

Winnipeg, Man.

Building permit was granted Douglas & Company, warehouse, west side Adelaide street, between Notre Dame and McDermot avenue, 25,000.

A permit has been issued to Henry Birks & Sons, for alterations to old Y. M. C. A. Building, $20,000.

Building permit has been issued to Telegram Printing Company, office building, west side Adelaide street, between Notre Dame and McDermott avenue, $22,000.

The Northern Crown Bank (R. Campbell, general manager, will make alterations to its premises here, costing $65,000.

Seventeen acres south of the Manitoba Rolling Mills have been sold to an American firm, who, it is understod, will erect a steel works on the site. G. A. Gareau effected the sale.

Marlatt & Clark Company, of Fort Atkinson, Wis., announce that they will establish a factory for the manufacture of creamery machinery here this year.

D. W. Bellhouse is the architect for the block to be erected for the Henderson Manufacturing Company. Noted in March 16th.

W. E. Cook, of Amherst, N.S., is said to have purchased the old Sterling block on Fort street and will erect a big fur factory to cost $45,000.

It is said that the O'Brien Terrace, opposite T. Eaton's, on Hargrave, will be converted into stores. The Western Loan & Mortgage Corporation effected sale.

The Bank of Hamilton will erect a north end branch, corner of Main street and Burrows avenue, this summer, two storey building, of brick and stone, $20,000.

It is stated that the Schlitz Breweries. of Milwaukee, will establish a branch brewery in this vicinity, possibly east of St. Boniface. Estimated expenditure, $200,000.

The C. P. R. will construct and equip stockyards to extend as far as McPhillips street. Controller McArthur is interested. F. W. Peters, 2nd vice-president C. P. R.

It is stated that Hon. Adam Beck, London, Ont., has accepted plans new box factory here.

AWARDED.

Brandon, Man.

The Brandon Construction Company, Limited, have been awarded the contract for the erection of an eight-storey business block for A. E. McKenzie Company, Limited. Reinforced concrete construction, using C. A. P. Turner's system, of Minneapolis; front, pressed brick and cut stone, curtain walls of brick. Probable cost, $90,000.

Edmonton, Alta.

The following is a list of tenders for Canada Permanent Building: Mr. Broughton, Edmonton, $55,950; Mr. McSporran, Edmonton, $51,448; Wm. Cannell, Edmonton, $57,300; Messrs. Sharp & Son, Winnipeg, $62,680; Messrs. Preasy & Batson, Edmonton, 52,350. Roland W. Lines, 57 Jasper west, architect. Noted in last issue.

Lethbridge, Alta.

The contract for the C. P. R. station has been let to McDermid & Company, of Winnipeg.

Montreal, Que.

General contract for cigar factory on St. Lawrence boulevard for Jose Granda, Limited, has been let to Sparrow & McNeil, Coristine Building. Jas. E. Adamson, architect, 630-631 Coristine Building, Montreal.

The contract for the office fixtures for the Workman Building has been awarded to Randolph & Company. MacDuff & Lemieux, architects, Merchants Bank Building, Montreal.

The contracts for alterations to the premises of 138 Peel street for R. J. Inglis, have been awarded as follows: Masonry and brick, Shearer, Brown & Willis; steel work, Phoenix Bridge Company; plastering, R. D. Clark; painting, R. E. Jones; plumbing and heating, Ogilvie Bros. MacVicar & Heriot, architects, 104 Union avenue.

Byers & Anglin have been awarded the general contract for the construction of the extensive additions planned by the A. E. Rea Company, Montreal. The contract for this work was signed on April 16th. A. F. Dunlop, architect, Lindsay Building.

The general contract for the erection of the new building for the Montreal Steel Company, Limited, has been awarded to C. E. Deakin, general contractor. T. Pringle & Son, architects, Coristine Building.

Ottawa Ont.

The Metropolitan Building Company have awarded contracts as follows for their 10 storey block, work on which will start after April 10th: John Coughlan & Sons, steel fabrication; Ross & Howard, cast iron bases; E. E. Davis & Company, steel erection; Wells Construction Company, preparation of site, concrete work and stone; Canada Foundry Company, ornamental iron; Barr & Anderson, steam heating; Dorel & Killing, plumbing; Sears & Company, bricklaying; Raftery & Company, expanded metal and plastering; Western Sheet Metal Works, sheet metal and roofing; Cope & Son, electrical work; Robert Stewart, Ontario, hardwood finishing; British Columbia Plate Glass & Importing Company, painting and glazing; A. & P. Steven, Glasgow, elevators. Total, $325,000. The contract for the model stone carving and general enrichment work will be awarded during the next few days.

Regina, Sask.

McGregor & Black have been awarded the contract for the immense new warehouse of the International Harvester Company in this city.

Saskatoon, Sask.

Jas. Colton secured the contract to build J. D. Ferguson's 3 storey block.

Contract has been given to the Trussed Concrete Steel Company, of Winnipeg, Man., for the erection of a flour mill for the Saskatchewan Milling Company, $75,000. Work expected to be completed by July.

Toronto, Ont.

The contracts for office and bank fittings for the Manufacturer's Life Building, corner King and Yonge streets, and Metropolitan Bank, corner Queen and Lansdowne, have been awarded respectively to Waterloo Office & Furniture Company, Waterloo, Ont.

Winnipeg, Man.

The Carter-Halls,-Aldinger have signed contract for erection of garage for Western Canada Motor Car Company, to go up on Garry street.

Wallaceburg, Ont.

Gilbert Little has the contract to build a new annex to the Tecumseh house; 30 x 36, 3 storeys high.

Power Plants, Electricity and Telephones

Fernie, B.C.

A $6,000 by-law for electric light extensions will probably be submitted.

Galt, Ont.

The offer of the Town Council of $16,000 for the poles and wires of the Galt Gas Light Company has been formally accepted.

Ingersoll, Ont.

The arbitrators acting for the corporation and the Electric Power & Light Company have put their valuation at $37,225. A by-law to provide for the acquiring of the plant will be submitted at an early date.

Kingston, Ont.

It is proposed by the towns of Eastern Ontario, from Trenton to Kingston, to discuss the power problem as to the feasibility of combining on either the Trenton Electric Company or Hydro-Electric Commission.

London, Ont.

The site for the Niagara power substation has been bought on corner of Kitchener avenue and Cabell street. Plans are being prepared by City Architect Nutter and work commenced at once.

Montreal, Que.

The Montreal Light, Heat & Power Company have notified the Board of Control that they will lay underground conduits for the purpose of burying their wires on certain streets in the east end of the city.

Ottawa, Ont.

The Hamilton, Waterloo & Guelph Railway Company's bill and the Toronto Eastern Railway Company's bill were passed.

Quebec, Que.

Plans of the Quebec Railway, Light, Heat & Power Company, as stated by the president, R. Forget, will include double tracks in the city and out as far as Ste. Anne de Beaupre, and also $15,000 on the Kent House as a place of amusement.

Stratford, Ont.

The power by-law for $85,000 has been passed.

Vancouver, B.C.

City Electrician McCrossan will show to the council the need of a new and separate building for his department.

Victoria, B.C.

Tenders addressed to W. W. Northcott, purchasing agent, will be received until April 25th for the installation of a complete system of cluster street lights. Plans at office of the above.

Winnipeg, Man.

It is stated that DeForrest has selected a site for his long distance wireless telephone station. J. H. Smith, Canadian manager, Enderton Building.

Tenders for the equipment of the McPhillips street substation will be called shortly.

Tenders addressed to Chairman, Board of Control, will be received until May 16 th for conduits, etc. See advertisement in this issue.

AWARDED.

Edmonton, Alta.

Tenders were considered for the motor equipment and air brakes for the new cars recently ordered from the Ottawa Car Company. The contract for motor equipment was awarded to the Canadian General Electric Company, at $2,600 each and that for air brakes to the Canadian Westinghouse Company for $440 per set f. o. b. Edmonton. The tenders of the Northern Electric & Manufacturing Company, Calgary, and the Wire & Cable Company, Montreal, were the same, each $1,300 lower than any of the others. The contract was awarded to the former at $13,727.89. Tenders for crucible steel and messenger wire for the telephone department were received as follows: Northern Electric & Manufacturing Company, Calgary; Gorman, Clancey & Grindley, Edmonton; Dominion Wire Manufacturing Company, Montreal; Canadian General Electric Company, Calgary. The last two tenders did not comply with the specifications The tender of the Northern Electric & Manufacturing Company, Calgary, at [illegible] being the lowest, was accepted. For the underground and aerial cable for the telephone department, tenders were received as follows: Gorman, Clancey & Grindley, Edmonton; Northern Electric Manufacturing Company, Calgary; Wire & Cable Company, Montreal; John A. Roebling & Sons, New York; [illegible] Company, New York; Standard Underground Cable Company, Pittsburg.

Montreal, Que.

The Canadian Light & Power Company have awarded to the [illegible] Development Company the contract for improvements to the Beauharnois Canal, between St. Timothee and Valleyfield. Fraser Brace & Company, of New York, have been awarded the contract for improvements to the mouth of the canal at Valleyfield. Estimated cost of whole, $750,000.

Nelson, B.C.

The contract for its new track, including roadbed, track, switches, pole system and trolley wires, was let to L. G. Brandt, of Nelson by the directors of the Nelson Street Railway Company. Construction has been commenced and will be carried on under the supervision of the city engineer.

St. Thomas, Ont.

Walter Mitchell, of Port Stanley, will supply 600 poles for the Hydro-Electric transmission line at 2,900.

Toronto, Ont.

For pole line supplies, the tender of the Canadian H. W. Johns-Manville Company was accepted at $1,157. Other bids were $1,225, $1,425, $1,450. Wire required for the Hydro-Electric system will be supplied by the Northern Electric & Manufacturing Company, at 16.5 cents a pound by rail and 16.45 cents by boat.

Tenders for laying conduits under the crossings in connection with the installation of the Toronto Hydro-Electric System, were as follows: $12,903.66, $11,387.08, $14,023,48. The lowest tenderer, the Safety Insulated Wire & Cable Company, of New York, received the contract.

Miscellaneous

Edmonds, B.C.

Until April 21st $16,500 school and $13,000 waterworks debentures of the corporation of Burnaby are offered for sale by C. T. Saunders.

Fergus, Ont.

Tenders will be received by Thos. Wilson until April 30th for erection of brick woodshed with metallic roof. Plans at News-Record office.

Huntsville, Ont.

By-law to raise $12,000 in 20-year debentures for the extension and improvement of the sidewalks and roads, was carried.

Hamilton, Ont.

Recent building permits include: James Bryers, brick dwelling, Tisdale street, for W. McDougall, $4,000; James Bryers, brick dwelling, Delaware avenue, for J. Smith, $5,000; Rastrick & Sons, three brick dwellings on Greig street, for T. Fanning, $4,500; Stewart McPhie, brick dwelling, Hess street, for Robert Fearman, $5,000; Stewart McPhie, brick church and rectory, Vic[illegible]; Stewart McPhie, brick dwelling on Hess street, for George Robertson, $1,000; E. B. Patterson, brick dwelling, Huron street, for R. Guy, $2,000; R. G. Wilson, brick dwelling, Wentworth street and Rutherford avenue, $2,500; H. Dunham, two brick dwellings on Madison avenue, for G. Greenway, $2,000; Stewart & Witton, frame building, Viewpoint avenue, mountain top, for the trustees of St. [illegible] brick store building, James street, for C. J. Myies, to cost $5,000; Stewart McPhie, [illegible] brick dwelling on Myrtle avenue, near [illegible]

Kingston, Ont.

Tenders addressed to W. W. Sands, city clerk, will be received until April 22nd for one hose wagon, one extension ladder, 1,400 lbs. bluestone, 400 zincs and 250 coppers.

Montreal, Que.

The Transportation Building Company have recently become incorporated with a capital of $750,000, special power being granted to this company to acquire the option to lease the lot 88 on the official plan of Central Ward, Montreal, granted by the Seminary of Montreal. Mr. Arnold Wainwright, of the Grand Trunk Railway Company, is one of the incorporators.

Recent building permits include: Albert Bleau, Mt. Royal avenue, house containing three dwellings, $6,000; A. Ladouceur, 11 Boucher, house containing five dwellings, $3,500; O. Briere, 1816 St. Urbain, house containing three dwellings, $3,000; A. Paquin, 113 City Hall avenue, house containing two dwellings and store, $8,000; J. A. E. Plante, 551 Clark, two houses containing six dwellings, $7,000; J. A. Hogue, 964 Sanguinet street, house containing three dwellings, $1,600; Boileau & DeMontier, six houses containing eighteen dwellings, $24,000; E. G. Dagneis, St. Urbain, two houses containing four dwellings, $4,000; O. Letourneaux, M.D., house containing three dwellings, $4,000; L. Hamslen, Cartier Square, two houses containing six dwellings, $6,000; Mrs. J. E. Cormier, Mance street, two houses containing six dwellings, $14,000; A. Malo, Bordeaux street, two houses containing four dwellings, $2,500; C. Guilmette, St. Andre C. Johnson, two houses containing six dwellings, $5,000; Lamarre Freses, Knox street, three houses containing eighteen dwellings, $8,500; Hall & Sons, Longue Pointe, one house containing one store, $1,850; A. Ledue, Nicolet street, one house containing three dwellings, $1,600; Commercial Ecole d'Hochelaga, 16 Desery street, one educational building, $48,000; Z. & J. St. Pierre, 951 Tupper street, one house containing three dwellings, $16,000; Alfred Pelletier, 132 Bordeaux street, two houses containing four dwellings, $3,000; A. Jean, 256 Bourbonniere street, one house containing two dwellings, $1,500; Corbell Freres, 192 Clark street, one house containing two dwellings, $2,750; Mederic Desautels, 183 Labelle, one house containing two dwellings, $4,000; W. Demontigny, 235 McCord street, one house containing two dwellings and one store, $4,000; E. Laliberte, 2472 Esplanade avenue, one house containing two dwellings and one store, $5,000; A. J. Darling, 104 St. Mark, one house containing one dwelling, $8,000; C. J. McCuaig, 735 Sherbrooke street, one house, $30,000; J. Crevier, 559 Laurier, $3,000; Mrs. D. W. Ogilvie, 11 St. Sacrament street, one house, $12,000; Ideal Savings & Loan Company, 290 St. Catherine street west, two houses containing four dwellings, $4,000; J. S. C. Martin, 650 Bourbonniere street, four houses containing twelve dwellings, $12,000; J. A. Drapeau, 38 Goselais, two houses containing [illegible]

Ottawa, Ont.

Recent building permits include: Joseph [illegible] Patrick street, $4,500; F. L. Campbell, [illegible] street, $10,000; J. D. Wilson, brick veneer [illegible] Laderoute, brick veneer houses, four in [illegible]

(Continued on page [illegible])

Tenders and For Sale Department

To Contractors

Sealed separate or bulk bids will be received by the undersigned up to 12 o'clock noon of MONDAY, [illegible] APRIL, 1910, for all the work and material required in the erection of a new wing to be added to the Royal Victoria Hospital, [illegible] Ontario.

Copy of plans and specifications may be obtained at the Hospital or at the office of the architect.

The lowest or any tender will not necessarily be accepted.

F. S. BAKER, Architect,
16 Traders Bank Bldg., Toronto.

The City of Calgary

Tenders will be received by the City Commissioners up to and including APRIL 22ND, 1910, at 4 o'clock p.m., for supplying the City of Calgary with the following material:

Salt Glazed, Vitrified Clay Sewer Pipe, according to specifications to be furnished by the City Engineer. Tender to state price, f.o.b. Calgary.

A marked cheque for $100 to accompany each tender.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary March 17th, 1910. 16

Department of Railways and Canals, Canada

Sault Ste Marie Canal

Notice to Contractors

Sealed tenders addressed to the undersigned and endorsed ''Tender for Removing Range Beacon, and widening the Channel at the Upper Entrance,'' will be received at this office until 16 o'clock on THURSDAY, THE 28TH APRIL, 1910.

Plans, specifications and the form of the contract to be entered into, can be seen on and after the 8th April, 1910, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Engineer in Charge, Sault Ste. Marie, Ont., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages Schedule prepared or to be prepared by the Department of Labour, which schedule will form part of the contract,

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $500.00 made payable to the order of the Minister of Railway and Canals, must accompany each tender, which sum will be forfeited if the party tendering decline entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfillment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 8th April, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 16

City of Port Arthur

Pavement Construction

Sealed tenders addressed to the undersigned and endorsed on envelope, ''Tenders for Pavement Construction,'' will be received up to 12 o'clock noon of

Saturday, April 30th, 1910

for aproximately 50,000 square yards of Sheet Asphalt or Asphalt Block Pavements on concrete foundation.

Plans, profiles, specifications and forms of tender are on file in the City Engineer's office, and specifications and forms of tender may be obtained from the City Engineer and any further necessary information.

A marked cheque for 10 per cent. of the estimated cost of the paving must accompany tender.

The cheques of unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

J. McTEIGUE,
City Clerk.

Corporation Offices, Port Arthur,
April 7th, 1910. 16

Department of Railways and Canals, Canada

Trent Canal

Ontario-Rice Lake Division
Section No. 4

Notice to Contractors

Sealed tenders addressed to the undersigned, and endorsed ''Tender for Trent Canal,'' will be received until 16 o'clock on THURSDAY, THE 5TH MAY, 1910, for the works connected with the construction of Section No. 4, Ontario-Rice Lake Division of the Canal.

Plans, specifications and the form of the contract to be entered into, can be seen on and after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Superintending Engineer, Trent Canal, Peterboro, Ont., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages Schedule prepared, or to be prepared by the Department of Labour, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signatures, the nature of the occupation and place of residence of each member of the firm.

An accepted bank cheque for the sum of $20,000,00 made payable to the order of the Honourable the Minister of Railways and Canals must accompany each tender, which sum will be forfeited, if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security for the due fulfillment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 7th April, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 16

City of Brantford

Tenders for Reinforced Concrete Bridge

Sealed tenders addressed to Ald. Joseph Minshall, in care of the City Clerk, Brantford, Ontario, will be received till 12 o'clock noon on

Friday, April 22nd, 1910

for a reinforced concrete bridge across the Canal on Market street The bridge will consist of one 60 foot arch span and aproaches, one 46 foot girder span, one 42 foot girder span and two 36 foot girder spans, all of reinforced concrete Length of bridge, 246 feet Width, 64 feet

Plans and specifications may be seen and instructions to bidders and forms of tender obtained at the office of the City Engineer. Each tender must be accompanied by a marked cheque for $1,000 payable to the order of the City Treasurer.

Copies of the plans and specifications may be seen at the offices of the ''Contract Record,'' Confederation Life Building, Toronto, and at B34 Board of Trade Building, Montreal.

The lowest or any tender not necessarily accepted.

T. HARRY JONES.
City Engineer.

City Engineer's Office,
Brantford, April 5th, 1910. 16

Department of Railways and Canals, Canada

Trent Canal

Ontario-Rice Lake Division
Section No. 6

Notice to Contractors

Sealed tenders addressed to the undersigned, and endorsed ''Tender for Trent Canal,'' will be received until 16 o'clock on TUESDAY, THE 26TH APRIL, 1910, for the works connected with the construction on Section No. 6, Ontario-Rice Lake Division of the Canal.

Plans, specifications and the form of contract to be entered into, can be seen on and after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Superintending Engineer, Trent Canal, Peterboro, Ont., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages Schedule prepared, or to be prepared by the Department of Labour, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signatures, the nature of the occupation and the place of residence of each member of the firm.

An accepted bank cheque for the sum of $10,000. made payable to the order of the Honourable the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent will be returned to the respective parties whose tenders are not accepted.

The cheque of the successful tenderer will be held as security or part security for the due fulfillment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 5th April, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 16

Marked Tenders

will be received up to SATURDAY NOON APRIL THE 30TH, for one Steel Bridge and Concrete Abutments, also one Reinforced Concrete Arch and Abutments, near Hensall, Ont. Plans and particulars here or at office of Fred Hesse, Township Clerk, Zurich, Ont.

Lowest or any tender not necessarily accepted.

F. W. FARNCOMB. C.E.,
16 64 Bank of Toronto Bldg., London, Ont.

Tenders for School

Sealed tenders will be received up to 6 p.m. on APRIL 28TH, for the erection of a Six-Room Combination School, to be built at Flesherton for the Township of Artemesin School Board.

Plans and specifications can be seen at my office, Flesherton, or at the office of Forster & Clark, architects, Owen Sound.

The lowest or any tender not necessarily accepted.

W. J. BELLAMY,
Secretary School Board.
April 20th, 1910. 16

Extensions to Schools

Sealed tenders, addressed to M. E. B. Cutcliffe, Chairman of the Buildings and Grounds Committee of the Public School Board, care of the undersigned at his office, City Hall, Brantford, will be received up to noon on WEDNESDAY, APRIL 27TH, for extensions to King Edward and Ryerson Public Schools.

Tenders must be accompanied by an accepted cheque, of not less than five per cent. of the amount of said tender.

Plans, specifications and all information can be had at the office of George W. Hall, architect, 321 Colborne Street.

A. K. BUNNELL,
16 Secretary.

City of Winnipeg Electrical Distribution System

Tenders for Conduit and Sub-Stations

Sealed tenders on prescribed forms, addressed to the Chairman of the Board of Control, Winnipeg Canada and marked [illegible] City of Winnipeg Electrical Distribution System [illegible] der for [illegible] will be received at the offices of the undersigned up to 11 a.m., on MONDAY 16TH MAY 1910 [illegible] items:—

No. 51 Conduit.

No. 52 [illegible]

No. 53 Sub-station Transformer and Switching Apparatus.

Copies of the plans specifications and forms of tender will be obtained at the [illegible] Office Carnegie Library Building Winnipeg.

These specifications may [illegible] the offices of [illegible] Confederation Life Building, Toronto, [illegible]

Each tender must be [illegible] cheque [illegible] to Bidders [illegible] to the Corporation in the event of the successful tenderer refusing or neglecting to sign a satisfactory contract [illegible]

The City reserves the right [illegible] all tenders, or to accept any bid which shall appear advantageous.

[illegible]

Office of the Board of Control,
Winnipeg April 14th 1910 [illegible]

City of Brandon

Sealed tenders will be received by the City Clerk, Brandon, Manitoba, "Endorsed Tender for Road Roller," until 12 o'clock noon on MONDAY, THE 25TH DAY OF APRIL, inst., for a Steam or Gasoline Road Roller, weight 12 tons.

Proposals must contain full specifications.

Roller to be delivered f.o.b. Brandon, freight and duty paid.

The lowest or any tender not necessarily accepted.

R. E. SPEAKMAN,
City Engineer.
Brandon, April 9, 1910. 16

Town of Sault Ste. Marie, Ont.

Notice to Contractors

Sealed tenders will be received by the Town Clerk, C. J. Pim, addressed to T. E. Simpson, Mayor, Soo, Ont., endorsed "Tender for Cement Walks," up till noon on MONDAY, MAY 2ND, 1910, for the furnishing of all materials for, and the construction of approximately One Hundred and Thirty-Eight Thousand (138,000) square feet of Cement Concrete Sidewalk.

Specifications and instructions to bidders to be seen at the office of the Town Engineer, Town Hall, Sault Ste. Marie, Ont., on and after April 15th, 1910.

The lowest or any tender not necessarily accepted.

T. E. SIMPSON, Esq., Mayor. W. F. GRANT, C.E., Town Engineer.
17

The City of Calgary

Tenders will be received by the Commissioners of the City of Calgary up to and including the 22ND DAY OF APRIL, 1910, at 4 o'clock p.m., for the construction of the following works, according to plans and specifications to be furnished by the City Engineer:

Five miles of sewer, including pipe.

Three miles of water mains, city supplying pipe.

A marked cheque for $500 to accompany each tender.

A bond of maintenance for one year signed by a satisfactory surety company to be delivered when work is completed.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.
Dated at Calgary 17th March 1910 16

City of Vancouver

Tenders for

Garbage Destructor Plant

[illegible] Vancouver, British Columbia. The plant must be capable of destroying not less than seventy [illegible]

Tenderers will be required to submit plans [illegible]

[illegible] of the contract price must be made with each [illegible]

[illegible] cepted.

W. McQUEEN,
[illegible]

PLANT FOR SALE

One No. 3 Gates crusher, complete.
Three revolving stone screens.
110 elevator buckets.
One 70 h.p. Loco fire box boiler.
One 30 h.p. Loco fire box boiler, on wheels.
One 25 h.p. Loco fire box boiler, on skids.
One 12 h.p. "Champion" boiler and engine.
One single drum Buffalo horse power.
One double drum horse power.
26 pairs 18-inch car wheels with axles, 3-foot 6-inch guage, with boxings.
A lot of derrick castings and irons.
Wire guys.
One piece of shaft, 3 7-16 inch by 13 feet 9 inches.
One piece of shaft, 2 15-16 inch by 12 feet.
One D. S. D. D. Steam Hoist.
Some belt pulleys.

J. C. INGLES,
16. Hagersville, Ont.

Town of Weyburn

Province of Saskatchewan

WATER WORKS AND SEWERAGE WORKS

Sealed tenders will be received by the Secretary-Treasurer of the Town of Weyburn, until 8 p.m. on WEDNESDAY, APRIL 27TH, 1910, for the following works:—

Contract "A"—Pipelaying on the Sewerage System.
Contract "B1"—Water Works Pump House.
Contract "B2"—Power House.
Contract "F"—Mechanical Water Filters.
Contract "G"—Water Works Pumping Machinery.
Contract "S"—Sewer Pipes.
Contract "W"—Furnishing Wooden Stave Pipes.
Contract "X"—Sewage Disposal Works.

Plans and specifications may be seen at the office of the Chief Engineer, Toronto and Winnipeg, and at the Town Hall, Weyburn.

R. H. SMITH, Esq., M.D., Mayor, Weyburn, Sask.
GEO. ROSS, Esq., Secretary-Treasurer, Weyburn, Sask.

WILLIS CHIPMAN, C.E.,
Chief Engineer,
16 Winnipeg and Toronto.

St. Augustine's Seminary

Tenders Wanted

Sealed tenders will be received, separate or in bulk, by the undersigned until 12 o'clock noon on WEDNESDAY, APRIL 27TH, for the Masonry, Reinforced Concrete Construction, Terra Cotta and Artificial Stone Work required in the erection of St. Augustine's Seminary on the south side of the Kingston Road near Toronto.

Plans and specifications may be seen at the office of the architect, and also at the office of [illegible] Toronto Street.

[illegible] ed cheque equal to five per cent. of the amount of tender, and security to the extent of one third of the amount of contract will be required for the faithful performance of the contract.

[illegible] cepted.

[illegible]
16 10 Bloor St. East

Positions Wanted

[illegible]

Tenders for

Sewer and Water Pipe

[illegible] will be received by the City of [illegible] B.C., [illegible] for supplying the city with the following material: Five miles Sewer Pipe, 2½ miles Water Pipe [illegible] according to specifications of [illegible].

The lowest or any tender not necessarily accepted.

R. POTTER, ESQ.,
City Engineer.

G. H. POULTON, ESQ.,
City Clerk.

Miscellaneous

[illegible]

FOR SALE—[illegible] (88) pieces of Lack[illegible] Steel Sheet Piling twenty two (22) feet long, [illegible] and three-quarter (12¾) inches wide, three-eighths (⅜) inch thick. WM. [illegible], [illegible], Ont. 18

Miscellaneous

(Continued from page 27)

brick store, Sparks street, $3,000; A. J. A. Coburn, brick veneer dwelling, Russell avenue, $3,000; Mark Wilson, brick veneer dwelling, Hamilton avenue, $2,500; Donald Fraser, five detached dwellings, Forest street, $3,150 for all; Martin Rosenthal, solid brick dwelling, Clemow avenue, $5,000; C. E. McDongal, brick veneer addition to dwelling, Besserer street, $2,500; Geo. Spratt, brick veneer dwellings, Spadina avenue, $2,000; Albert Blyth, brick veneer dwelling, Park avenue, $4,300.

Niagara, Ont.

Tenders addressed to the Secretary of the Militia and Council Headquarters, Ottawa, will be received until April 27th for the construction of an earth stop butt for the new rifle range here. Eugene Fiset, colonel.

Regina, Sask.

By-laws have been given their preliminary readings providing for an expenditure of $415,000, distributed as follows: Sewers, pavements, $115,000; sidewalks, $10,000; children's shelter, $10,000. These will be presented to the ratepayers for ratification at an early date.

St. Thomas, Ont.

The by-laws to loan the Norsworthy Company $10,000 to manufacture furnaces, and the Nursery Shoe Company $15,000 to start a shoe factory, both passed.

Toronto, Ont.

Recent building permits include: R. A. Nisbitt, 2 sty. and attic brick dwelling, S.E. cor. Dunvegan & Heat, $6,200; T. Gibson, 2 1-2 sty. brick dwelling, on Roxborough St. E., $8,000; Wm. Prince, 1 pr. semi-det. 2 sty. brick dw., Gladstone, $4,000; W. A. Levy, 2 1-2 sty. brick dwelling, near Forest Hill, $7,000; G. L. Thompson, 3 att. & E pr. 2 sty. brick dw., on 256 to 264 Beatrice, $10,000; G. Henry, 2 sty. brick dwelling, Rusholme, $5,000; R. Dale, 2 sty. brick dwelling, on 28 Castle Frank Ave., $4,000; B. H. Fraser, 10 att. 2 sty. brick dwellings, Logan, $13,000; Ed. Carmichael, 1 pr. semi-det. 2 sty. brick dw., Fairview, $4,000; H. Ransome, 1 pr. semi-det. 2 sty. brick dw., on E. S. Lansdowne, $4,000; Miss M. Macdouball, 2 sty. brick dwelling, on Foxbar road, $6,000; H. Francis, 1 pr. semi-det. 2 1-2 sty. mrick dwellings, $4,600; R. H .Bullen, 3 sty, brick apartments, Maitland, $6,000; Geo. Brigden, 2 1-2 sty. brick dwelling, Dunvegan, 7,000; Fred. Nicholls, 5 sty. brick warehouse, on 218 King St. W., $34,000; W. J. Greenaway, 2 1-2 sty. brick dwelling, near Dunn, on King, $5,000; J. Hind, 2 sty. brick dwelling, near Queen, on Herbert, $4,000; Malloy & Bryans, 1 pr. esmi-det. & attic brick dwellings near Oundas, on Ritchie $5,000; A. W. Phillips, 3 sty. brick dwelling, near Clendonwin, on Evelyn, $4,500; O. Hoover, 2 1-2 sty. brick dwelling, near Avenue road, on N.S. Lynwood, $5,000; Ely Switzer, 1 pr. semi-det. 2 sty. brick dwellings, Crawford, $4,000; W. A. Forster, 3 att. 2 sty. brick dwellings, on 99-103 Anne, $6,900; H. P. Hillman, 1 pr. semi-det. 2 sty. brick dwellings, Aberdeen, $5,000; Geo. Birdsall, 2 det. 1 -2 sty. brick dwellings, $8,000; T. J. Brown, 3 pr. semi-det. 2 sty. brick dwellings, Dundas, $12,000; W. H. Parker, 1 pr. semi-det. 2 sty. and attic brick dwellings on Logan, $4,500; Jas. Stewart, 1 pr. semi-det. 2 sty. and attic brick dwellings, Crawford, $4,600; H. E. Simpson, 1 pair semi-det. 2 1-2 sty. rbick dwellings, Walter, $6,200; W. Allen, 2 det. 2 1-2 sty. brick dwellings, Wright, $6,000; H. H. Halls, 2 sty. and attic brick dwelling, on corner Ridout and Indian crescent, $4,500; H. M. King, 2 prs. semi-det. 2 1-2 sty. brick dwellings on 120-126 Sunnyside, $9,000; V. Gianelli, alterations to hotel, on Queen and Gladstone, $8,000; Wm. Maffey, 1 pr. semi-det. 2 sty. brick stores and dwellings, Broadview, $4,600; F. G. Smith 2 det. 2 1-2 sty. brick dwellings, Rose Hill Ave., $6,000; W. W. Holtz, 3 det. 2 sty. roughcast dwellings, brick fronts, on 19-21-23 Dingwall, $4,500; N. C. McEachern, 1 pr. semi-det. 2 sty. brick dwellings, on 54-56 Wineva, $4,000; C. A. Jones, 1 pr. semi-det. 2 sty. brick dwellings, Fairview, $4,000; J. J. Tracey, 1 pr. semi-det. 2 sty. brick dwellings, Lansdowne, $4,000; J. J. Walsh, 2 det. 2 1-2 sty. brick dwellings, on 118-120 Dowling, $6,400; D. E. Moore, 3 att. 2 sty. brick dwellings, on N.S. Wallace, $6,000; Robertson Bros., 4 sty. brick addition to factory, on 109-111 Queen St. E., $5,000; T. A. Duggan, 2 sty. and attic brick dwelling, on S.S. Wellesley, $5,000; C. D. Smith, 2 pr. semi-det. 2 1-2 sty. brick dwellings, Woodlawn, 12,000; E. M. Cchildrick, 2 sty. brick apartments, corner High Park and Indian road, $10,000; H. Denison, 2 sty. brick dwelling, on 135 Springhurst, $4,000; Grant & Ward, 1 pr. semi-det. 2 sty. brick dwelling on 33-35 Parkway, $5,000; J. J. Walsh., J. pr. semi-det. 2 1-2 sty. brick dwellings, on 1490-2 King St. W., $6,000; Geo. Phillips, 3 att. 2 1-2 sty. brick dwellings, NW. corner Winchester and Sackville, $7,000; Mr. Oliphant, 1 pr. semi-det. 2 sty. brick dwellings, on Walter street, $4,000; T. W. Murray, 3 pr. semi-det. 2 sty. brick dwellings, Grafton Ave., $12,000.

Victoria, B.C.

Building permits have been issued to C. M. Cookson for the erection of a three storey brick building on Pandora avenue, $8,000; Switzer, two storey six room dwelling on Battery street, $3,400; W. Warburton, for a one storey six roomed dwelling at the corner of Cook and Pendergast streets, $2,600.

Vancouver, B.C.

Tenders are being called until May 31st for the installation of a garbage destructor plant. See advertisement in this issue.

Recent building permits include: T. H. McKay Company, Limited, frame sash and door factory, 2466 Glen drive, $12,500; S. Tamura, alterations, Granville street, $5,000; Oliver & Wilson, two frame dwellings, 214 and 204 Twelfth avenue, $5,000; Mr. Mutch, 2636 Yukon street, $4,500 G. Tyson, 2029 Turner street, $2,500; J. S. Chisholm, 1957 Seventh avenue east, $5,200; W. W. Welsh, Pender street, $2,000; M. J. Henry, Westminster road and Fifteenth, $3,500; R. F. McKenzie, 1330 Lakewood drive, $2,000; D. S. Baynes, 1569 Twelfth avenue, $3,000; S. Chalwin, Point Grey road, $5,500; M. T. Morrison, 1122 Semlin drive, $2,200; F. Baylis, 1620 Yew street, $2,500; W. Hunter, 757 Twelfth avenue, $2,000; Whicker & Ives, 254 Fourteenth avenue, $2,000; Wicker & Ives, 2173 Sixth avenue west, two houses, $4,000; S. P. Gilbert, 549 Fourteenth avenue east, $2,000; N. J. Davis, 1234 Twelfth avenue east, $2,000; Mrs. Wright, 1566 Eleventh avenue east, $2,000.

Recent building permits include: M. & A. Tucker, Vernon street, $2,000; J. Morley, Seventh avenue, $4,500; W. C. McKinn, 215 Sixteenth avenue east, $3,000; S. Armour, 1968 Sixth avenue west, $2,000; H. R. Walsh, 1816 Arbutus street, $2,000; Dr. Symington, 2305 Eighth avenue west, $3,500; Coffin & McLennan, 1035 Eleventh avenue west, $3,500; Hopps, 123 Twelfth avenue west, $3,600; Annie Morrison, 2837 Third avenue west, $2,000; Miss Maud Schumunger 2337 First avenue, $6,800; M. B. King, 1534 Harwood street, $7,500; John Taylor, 1329 Walnut street, $2,500; J. Skeffington, 1223 Victoria drive, $2,450; S. Falck, 2063 Third avenue west, $6,600; Mrs. Powell, 2820 Spruce street, $2,626; W. J. Herrington, 1106 Thirteenth avenue west, $12,000; W. W. Brehaut, 1228 Maple street, $4,000; F. Bayliss, 1118 Arbutus street, $4,000; Mrs. Cleator, 2931 Scott street, $3,000; George Simons, Hastings street east, $13,000; G. C. Ossenger, 2616 Clark drive, two houses, $3,100; W. W. Ross, 1816 Alberni street, $3,000; L. P. Newton, 1054 Pender street, $4,000; M. G. Oliver, 1255 Fourteenth avenue west, $2,500; S. MacLennan, 2033 Semlin drive, three houses, $7,500; G. Wilbur Smith, frame dwelling 2335 Ontario street, $3,000; Dominion Government, alterations, Pender street, $10,000; Chas. Phillips, frame dwelling, 2476 Fifth avenue, $2,500; W. C. Fisher, frame dwelling (4) 2349 Keith street, $6,400.

Waldron, Sask.

Tenders are being called until May 2nd for purchase of $5,000 5 per cent. 15-year debentures.

Winnipeg, Man.

Recent building permits include: J. F. Parker, four dwellings, Aubrey street, $8,000; J. Thom, Rosedale avenue, dwelling, between Nassau and Pembina streets, $7,500; W. J. Armstrong, dwelling, Horne street, $2,500; J. D. Ormsby, dwelling, Campbell street, $5,000; W. McIntosh, dwelling, Home street, $4,200; Simpson and King, dwelling, Horne street, $7,000; J. Eggertson, dwelling, Lipton street, $5,000; F. C. Woodcock, house, west side Nassau, $2,250; Arni Egertson, store, south side Sargent, $4,500; W. J. Hood, house, east side Chestnut, between Buell and Ida, $15,000; W. E. Webb, house, north side Elgin, $3,000; Harry Fisher, dwelling, Casey, $3,600; H. Dilts, dwelling, Jessie; J. G. Chapman, dwelling, McMillan, between Aynsley and Lilac, $3,000; Cooper and Bodman, dwelling, corner McPhillips avenue, $2,000; C. P. R. warehouse, south-east corner McPhillips and Jarvis, $3,000; W. W. Chislett, dwelling, Jubilee, $3,500; D. Boyce Sprague, dwelling, McMillan, $12,500; Mrs. W. C. Perry, dwelling, Mac street, $3,300; T. D. Lawrason, brick dwelling on Cottage avenue, near Aberdeen avenue, $2,000.

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Hamilton Stamp & Stencil Works for enamel street signs, blue background 3 1-2 inch white letters as per sample, at 32 1-4 cents. Aproximate number required, 1,400.

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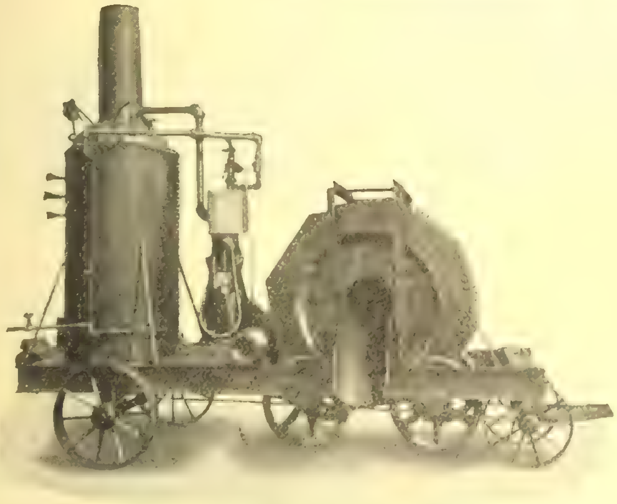

The loading hopper on our one-half yard mixer has a capacity of one half-yard of **unmixed material.**

A strong feature. The gate between hopper and mixer is so arranged that while one batch is being mixed and discharged the laborers are busy filling the hopper.

When the mixing batch is discharged the engineer pulls gate allowing unmixed batch to run into mixer and then closes gate, immediately permitting reloading of hopper to proceed almost uninterruptedly.

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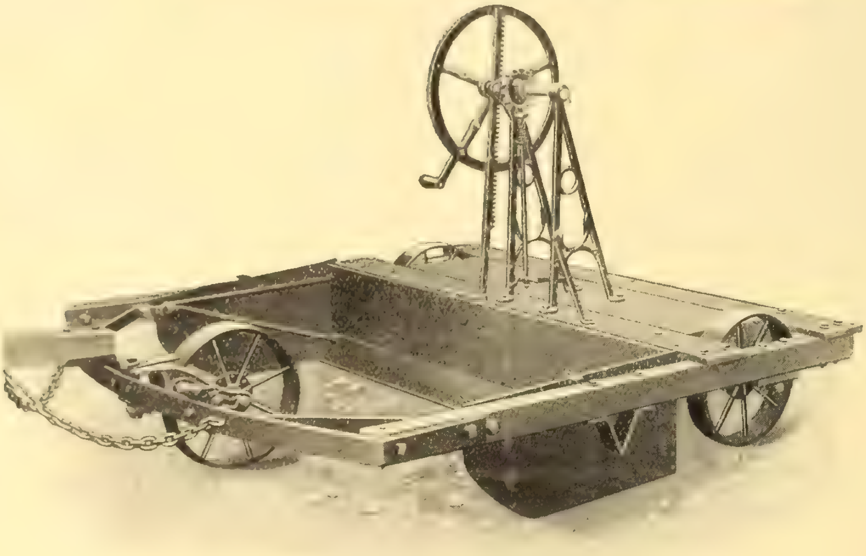
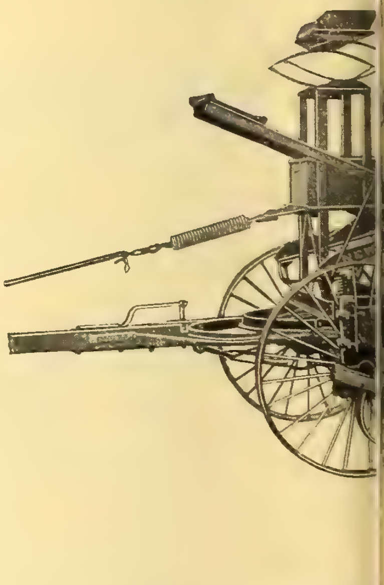
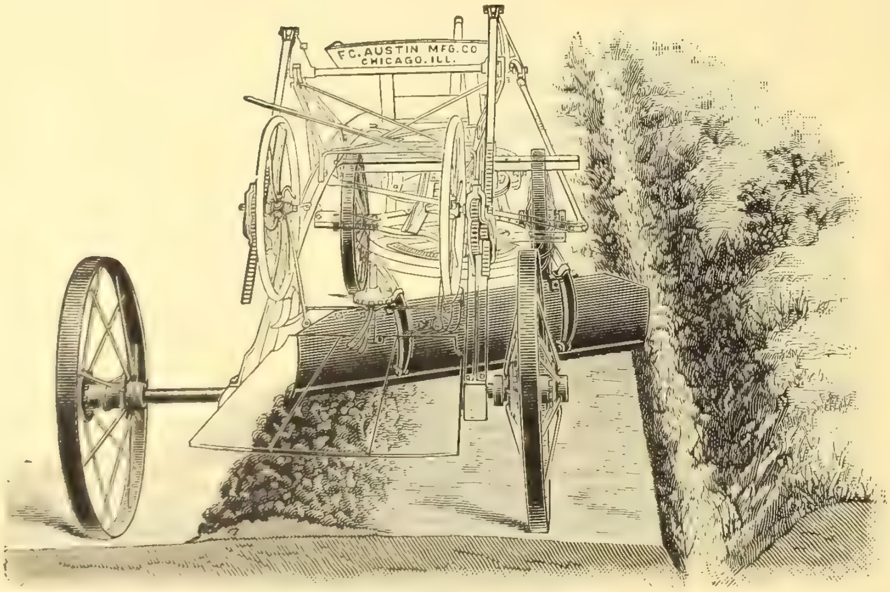


SHUART EARTH GRADER.





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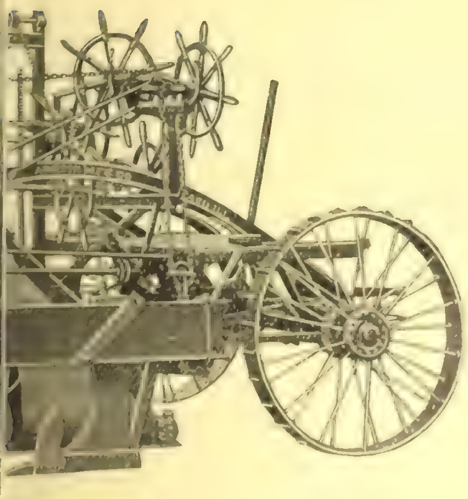

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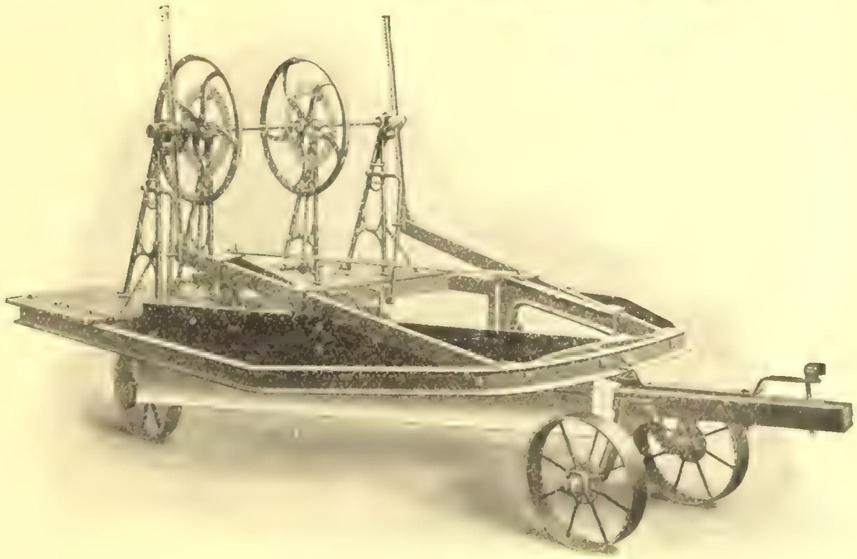
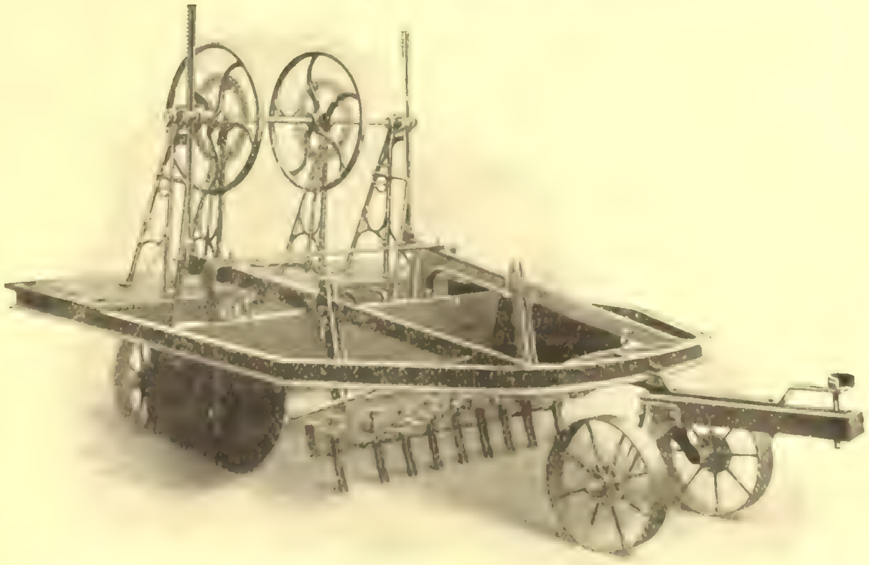


LITTLE YANKEE REVERSIBLE GRADER.



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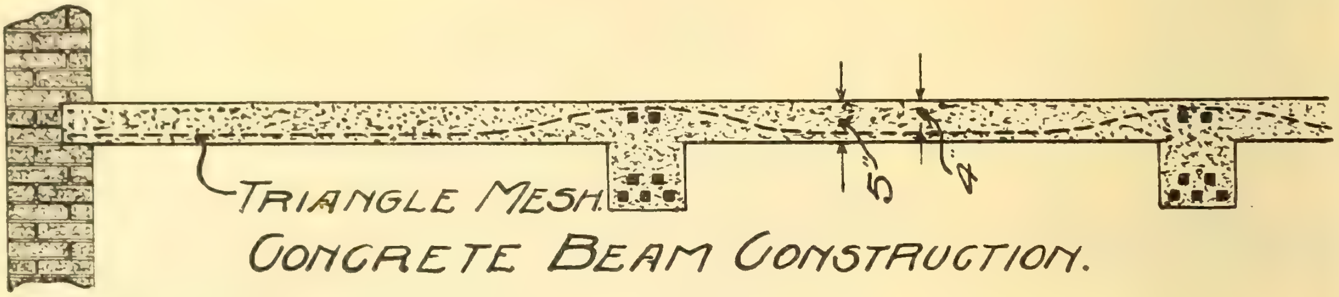
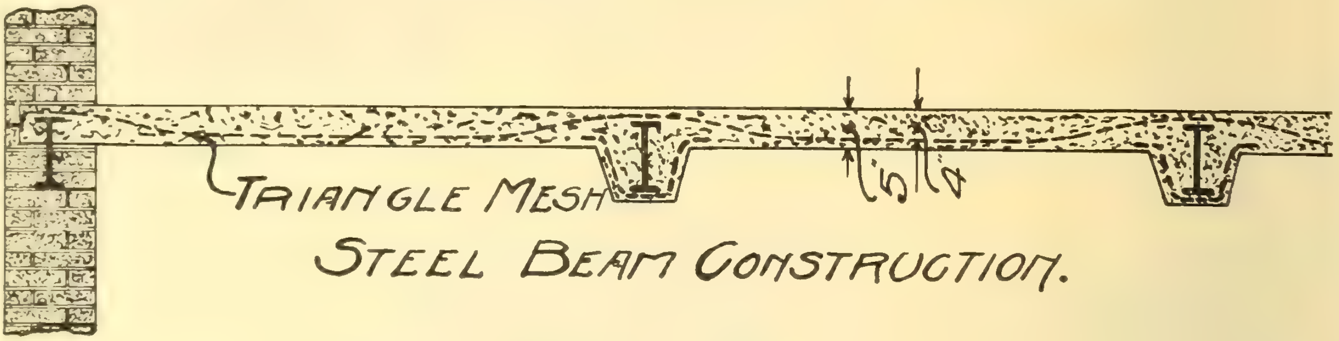


Detail of construction of span showing continuous bond and location of the triangular mesh reinforcement as applied to floor construction.



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ESTABLISHED 1886

Contract Record

A Weekly Journal of
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Municipal Progress, Advance Information

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Vol. 24 Toronto April 20, 1910 No. 16

Building Statistics and Trade Conditions

The building statistics published in this issue should strengthen the confidence of all who are in any way interested in the field of building and development throughout Canada.

General commercial conditions could hardly be better than at present and the prospects are excellent. The situation in regard to labor is not wholly developed, but if there is any tendency it is towards improvement. A few demands for increases have been mentioned already and more have been intimated. Whether this will be the sum total will depend, of course, largely upon the amount of labor available. It is to be hoped that contractors will not have to accept all kinds of men regardless of qualifications and fitness.

There is a stiffening movement in all lines of building materials. Common brick is scarce, with Toronto prices ranging from $9.50 to $10.50. The situation will be relieved, temporarily at least, when fresh supplies come in next month. For red and buff pressed, prices are $17 at works and $18 delivered. A scarcity of sewer brick is noted. City Engineer Rust reports delay on section [illegible] of the trunk sewer owing to [illegible]. There is a good demand all round for lumber. At Winnipeg, pine and fir products are quoted at $2 to $4 a thousand higher than was asked at the beginning of the year. Supply dealers in the latter city are working overtime. Their chief concern, also, at present, is a shortage of brick. The same complaint is made at other points, notably at Fort William, Brandon and Calgary.

Cement is quoted at Toronto at $1.75 a barrel, and in 1,000 barrel lots, $1.60. For barrel lots in bags, delivered, the price is $1.90, bags extra. The Montreal quotation for car lots, f.o.b. Montreal, is $1.30 to $1.40 per barrel of 350 pounds, bags extra.

To those who are still lacking in confidence—and they are always to be found—we would point to the reports contributed by city officials and others and reprinted in this issue. After reading these a man can come to but one of two conclusions: either that 1910 is going to be a record-breaker or that the aforementioned city officials and others are void of all moral worth and responsibility.

Completion of Work Within Time Limit

One of the penalties of a busy season is the increasing tendency to delay in the progress of work under way. Complaints are not infrequent of contractors on street work allowing construction to drag long after the time set in the contract for completion. There is a penalty existing in most contracts, but contractors often request an extension of time and a waiver of the penalty which leads to vigorous objection. Any contractor of experience knows that it is not always possible to avert delays, which are caused by belated supplies or other interferences.

It is not uncommon for officials to demand the completion of the work in a shorter time than is practicable, with an understanding that no particular objection will be raised if the work is not done within the limit. Too much chance is being taken in allowing contracts to be dragged out interminably, and it is apt to cause a great deal of trouble. Every possible step to hasten the work should be taken, and everything done to anticipate needs. This will give those who are delayed an opportunity to show their good faith to the uttermost in the work, and should help materially in convincing boards of their right to ask for the desired extension of time.

Provide Against Possibility of Increased Cost

Now that the active building season has started there comes the probability that there will be numerous minor increases in cost of materials and to some extent upon labor, the latter being undetermined as yet. Architects and builders will do well to remember this fact in making estimates upon new work, for it is an uncomfortable fact that an owner will admit numerous changes in plans, but seldom will admit an increase in the cost of the proposed structure. Estimates should therefore be based with some leeway to allow for possible increases, without [illegible] the original price.

[illegible] manufacturers [illegible] with the labor unions of Minneapolis, Minn., have succeeded in pre- [illegible]

1910 Promises to be Record Building Year

Statistics for Three Months Show an Appreciable Gain over First Quarter of 1909—An Approximate Increase of 65 per cent.

While the building statistics for the first three months of the year reflect the least activity of any quarter, the accompanying comparative figures are of interest in that in most cases they indicate appreciable advances over the similar period of 1909, which was considered an exceptionally good year. In some cases, of course, a heavy increase in percentage may indicate only a relatively small volume of business, but on the whole the advances mark what may be termed by our Canadian standard, natural growth. In most of the large cities, a feature of the season is the number of large projects under way and contemplated.

The accompanying statistics are arranged in the order of magnitude for the first three months of 1910. The records made by Vancouver and Winnipeg are excellent. Vancouver's position at the head of the list with a total approaching three and a half millions and an approximate increase of 111 per cent., will be an especial source of gratification to many people allied with building and contracting interests who have been making a special effort to develop this territory during recent years, and it is a significant indication of what may be expected in the busier part of the season. Compared with the figures stablished by Winnipeg, Toronto's increase of 6.4 per cent. appears to small advantage. The east and the west, however, are progressing along somewhat different lines and the conditions of their respective business admit of no cursory comparison.

Notable increases are made at Regina, Sask., 38 per cent., and Saskatoon, Sask., 785 per cent. Regina is particularly active this season and is sparing no effort to direct the attention of capitalists to its many advantages. As stated in a recent issue, a scarcity of labo is anticipated in this city. This is at present the only cloud on the horizon. Regina is certainly worth watching. Ottawa and Hamilton's increase of 59 per cent and 77 per cent. respectively, furnish incontestable ev dence that progress is not confined exclusively to western Canada. The accompanying reports substantiat the optimistic character of our review, which is furthe supported by a percentage gain for Canada of 65.

Town or City	Mar 1909.	Mar. 1910.	1st quarter, 1909.	1st quarter 1910.	Approx Increase % 1st quarter.
Vancouver, B. C.	$ 800,250	$1,808,766	$1,575,535	$3,320,872	111
Toronto, Ont.	1,703,840	1,583,165	2,936,900	3,125,693	6.4
Winnipeg, Man.	861,200	2,526,350	1,070,000	3,031,950	183
Montreal, Que.	376,275	676,804	731,725	1,093,244	49
Victoria, B.C.	121,640	243,010	322,300	525,005	63
Regina, Sask.	72,730	329,650	78,795	382,490	386
Ottawa, Ont	144,125	219,350	234,965	374,200	59
Hamilton, Ont.	172,350	289,390	195,900	346,040	77
Edmonton, Alta.	179,395	264,435	312,035	337,555	8
Saskatoon, Sask.	29,400	250,275	35,100	310,525	785
London, Ont.	69,095	139,700	164,280	221,832	35
Lethbridge, Alta.	77,035	133,220	116,965	201,305	72
Fort William, Ont.	56,000	91,575	388,675	161,190	59*
Strathcona, Alta.	13,700	113,575	13,700	115,025	740
St. John, N.B.	9,350	48,250	18,650	94,750	408
Halifax, N.S.	109,490	43,800	147,505	88,975	40*
Moose Jaw, Sask.	7,950	58,825	7,950	69,875	778
Sherbrooke, Que.	.....	......	50,000	60,000	20
North Vancouver, B.C.	.....	11,800	9,000	48,750	442
Windsor, Ont.	40,125	27,225	62,700	37,975	39*
Brandon, Man.	5,000	27,060	6,000	29,385	390
Stratford, Ont.	9,561	13,310	14,486	21,570	49
Sydney, N.S.	3,540	17,935	9,040	20,910	131
Kingston, Ont.	15,000	14,850	31,200	20,875	33
Peterborough, Ont.	5,965	10,327	9,160	17,477	91
Lindsay, Ont.	2,200	5,600	3,300	12,800	288
Port Arthur, Ont.	1,200	5,360	1,700	5,360	215
Collingwood, Ont.	3,500	4,600	4,200	4,800	14

*Decrease.

Conditions and Prospects throughout Canada

Vancouver, B.C.—S. H. Jarrett, building inspector: "Ther is every prospect of a very busy year in this city. I feel co fident that Vancouver will lead the continent in the per capit value of buildings."

Toronto, Ont.—P. L. Fraser, secretary Builders' Exchang "The feature of the building situation in Toronto this seaso is the increased amount of work in larger structures and important buildings. In the smaller class of work there is much activity as last year. At present there is nothing i sight likely to hold up building operations so far as materia are concerned, excepting perhaps brick, which promises to be more or less scarce all the season. Little trouble is apprehended from labor sources. The bricklayers, stonemasons and plasterers have agreements which will carry them through the year. The carpenters have been offered an increase of about 5 per cent. and this increase is likely to mark the prevailing rate for the season. The Master Painters' Association, which supports the open shop principle, have received demands for an increased rate, but it is not likely that the union will obtain an agreement. There is noteworthy activity in real estate. This is likely to have a stimulating effect upon building."

Winnipeg, Man.—Our Winnipeg correspondent writes: "1910 is the greatest year that western contractors have ever experienced. In this city, more than at any other western point, excepting perhaps Vancouver, the expansion is particularly noticeable. Building prospects materialize and other projects arise in a manner that gives undeniable proof of a new era of prosperity. Labor troubles thus far have been singularly absent. The latest discussion in trade union circles is the possibility of increased wages for the painters. The present minimum scale is 30 cents an hour, and the men

Montreal, Que.—Alcide Chausse, building inspector: "Building prospects are very good. A number of important projects will be carried out this year and architects generally are busy preparing plans for industrial and office buildings, apartment houses, residences, etc."

Regina, Sask.—H. C. Lawson, secretary Board of Trade: "The percentage of increase in building from month to month is a good estimate of a city's prospects. It will be seen that the increase for the first quarter in 1910 over the similar period of 1909 is no less than 386 per cent. That for March, 1910, over March, 1909, is 350 per cent. A large proportion of the permits taken out this year were for high class dwellings and substantial business blocks. Out of 51 permits issued, 38 were for residences. With a continuation of the present conditions 1910 will be a record-breaker for Regina."

Edmonton, Alta—John D. MacKinnon, building inspector: "Prospects in every line of building and development are particularly good. 1910 should be a very busy year."

Saskatoon, Sask.—Our western correspondent writes: "Building permits continue to mount up steadily in this city. The increase for the first three months of 1910 over the same period of 1909 is typical of the progress being made in this part of the country. Some of the more optimistic ones think that the total for the year will reach three million dollars. When the proposed university, new schools and projected commercial and residential buildings are considered, this large figure will be pretty well accounted for. An important feature of the situation is the large number of substantial residences projected and under way."

Fort William, Ont.—S. Macnamara, building inspector: "The Union Depot at the moment heads the list of work in hand. $250,000 will be expended on this building by completion. There are in course of erection a large number of private residences, at double the estimated cost for the same class of building over the corresponding period of last year. The architects have plans for some very fine residential property ranging in value from $20,000 down. The prospective work for this summer includes the Seaman-Kent building at an estimated expenditure of $150,000, the International Harvester Company's building, $250,000, a large addition to the C.P.R. machine shops, two bridges, docks and slips, also a theatre, hotel, large automobile garage and several business blocks. Altogether the prospect looks exceptionally good and it is anticipated there will be a very busy season in and around the city."

North Vancouver, B.C.—Thomas Shepherd, city clerk: "The present season will doubtless far exceed any previous year in regard to building operations. It is noteworthy that a large number of investors are establishing their homes in this city. The demand for houses available for tenancy is far in excess of the supply. North Vancouver possesses enviable advantages for residential purposes and we are anticipating a record year."

Windsor, Ont.—Mr. G. W. Freeman, secretary Builders' and Contractors' Association: "The building business never before gave so much promise as it does now. We thought last year was good, but the prospects for 1910 are away ahead of those for 1909 at the same period. Windsor is on the eve of a building boom. A sufficient number of mechanics is not available for the word in hand."

are asking for a minimum of 40 cents. This increase sounds rather unreasonable. Most of the contractors have signed up with the carpenters, masons and other trades on the schedules which prevailed last fall."

Brandon, Man.—Our western correspondent writes: "If the earliness of the season and the size and class of the projected buildings and those in course of construction can be taken as a fair criterion, it is safe to say that 1910 will eclipse any other year in the history of the city, at any rate, as far as the building industry is concerned. Many important projects are contemplated. Important additions will be built to several factories and warehouses. The Hanbury Manufacturing Company announce that they will double the capacity of their whole establishment, including factories, mills, warehouses and offices, and install a great quantity of new machinery. Clement Bros. have started the erection of a modern business block. Several large commercial buildings will be erected on Tenth street. The city will probably build a new fire hall this year."

Stratford, Ont.—P. H. Myers, building inspector: "We expect this to be a good year. A good quantity of material is on hand and some pretty fair contracts have already been let. Prospects are good."

Sydney, N.S.—D. Campbell, building inspector: "The outlook for the building trade in this locality is very promising. Building permits during the first week of April included those for the St. Andrew's Church, to cost $42,000, and a new fire station, to cost $14,300."

North Bay, Ont.—N. W. Flannery, town clerk: "Prospects for the building season are very good. Plans have been prepared for several business blocks and the erection of a great number of private residences is contemplated."

Goderich, Ont.—L. L. Knox, town clerk: "We are looking forward to a very busy year. Among the buildings under way or contemplated may be mentioned the new public school, to cost $25,000; the 500,000 bushel concrete annex for the Goderich Elevator & Transit Company, and the 500,000 bushel elevator for the Western Canada Flour Mills Company. In addition to these works, the Government will spend $80,000 on harbor improvements and $10,000 on the extension to the postoffice. A large amount of residence work is projected. The Ontario West Shore Electric Railway, from Goderich to Kincardine, is now under construction."

Port Arthur, Ont.—J. McTeigue, city clerk: "As there were no regulations governing permits outside the fire limits, until March 29, 1910, our building statistics are not of very much value for purposes of comparison. The fire limits comprise but a small area of the city, and the greater amount of building was carried on outside these limits."

Red Deer, Alta.—A. T. Stephenson, building inspector: "There is every indication of increased activity this season. The Canadian Pacific Railway Company have called for tenders for a new [illegible] depot. The Canadian Bank of Commerce have plans out for a new bank building, and a number of modern houses are to be built this summer. The town is building cement sidewalks along the principal business streets."

Square Garments, Limited (overall and shirt manufacturers), have purchased lots on which they are going to build a factory employing about 30 hands. The Vanslyke Plow Manufacturing Company have rented premises to commence operations, and will probably build a factory later. The Alberta Grain Company purpose building a warehouse. The public school board is remodelling the old school for a high school building."

Collingwood, Ont.—J. H. Duncan, town clerk: "The prospects for 1910 appear very bright. The Shipbuilding Company have extensive plans on hand. They have a contract for a large steel freighter which will bring about 2,000 people into the town. A considerable amount of work that was undertaken last fall is now being finished."

Virden, Man.—From a builder's and contractor's standpoint, 1910 promises to be the best year in the history of the town. Dealers in supplies report numerous inquiries. A season of unprecedented building activity is anticipated in this vicinity.

Woodstock, Ont.—John Morrison, city clerk: "Prospects for 1910 are good. We have two new ward schools under contract and there is talk of erecting a new city hall. The average amount of private building is under way."

Chilliwack, B.C.—J. H. Ashwell, city clerk: "Building conditions are very brisk this year and the prospects exceedingly bright on account of the extension of two railways and tram line into this city."

Dartmouth, N.S.—R. Eccles, secretary Board of Trade: "There are no building operations being carried out on a large scale in this vicinity. About 40 houses were erected in this town last year, and that is about the number likely to be erected during 1910. We have no building statistics, as permits are not required."

Kamloops, B.C.—J. J. Carmen, city clerk: "The value of buildings erected during 1909 was about $70,000. Two buildings already started during 1910 are worth about $45,000. We are looking for a noteworthy increase during 1910."

New Westminster, B.C.—W. A. Duncan, city clerk: "Building conditions and prospects for the present year are exceptionally good. A feature of the situation here is the activity in real estate. A building by-law is now in preparation. When this comes into force proper building statistics will be available."

Hints on Constructing Cement Sidewalks

The following hints have been taken from a paper by Mr. N. E. Murray, presented at the last annual convention of the Illinois Society of Engineers and Surveyors:

Before constructing cement walks on a foundation that has been travelled over for several months, "pick up" the entire surface, flood and retamp it. The reason for this is obvious. On filling of this character the foot travel generally follows one well defined line, usually in the centre, which becomes solid and well packed and will not "settle" under additional weight; while the filling to either side of the centre, on being given additional weight, usually settles sufficiently to cause a crack lengthwise through the walk, unless the entire surface is loosened and retamped to a uniform density before the concrete is put on.

A successful contractor states that in cold weather he mixes the concrete as dry as it is possible to have it, and then puts in the base in two courses, tamping each course separately—in this way obtaining a more uniform density in the concretes, and as a result has never had to record a "failure" in his work. Better results will be obtained and fewer walks with loose and cracked wearing surfaces would be seen if workmen could be made to understand that a wearing surface will not adhere to, or form a bond with, a base covered with loam or dirt which they have "tracked" over it either through carelessness or in order to save a few steps.

Clean cut joints between the slabs and expansion joints adjoining the curbs at streets and alley returns, and at frequent intervals in long stretches of walk, are absolutely necessary if broken curb stones and broken slabs in the walks are to be avoided. Expansion joints at street and alley returns can be eliminated by constructing the curbing with a "recess" into which the sidewalk slab may be laid.

The Selection of Wall Paper

Walls are not so extensively covered with paper now as they formerly were, but wall paper is still a favorite with many home builders, and holds a leading place in the industrial activities of the world. Its selection is, of course, largely a matter of personal taste, but there are certain rules which should never be ignored by the purchaser. "Beautiful Homes" gives these valuable hints, secured from a wall paper expert:

Large figured papers should never be used on low-ceilinged rooms. Plain colors and self-toned stripes increase the apparent height of a room, and for this reason are preferable in low-ceilinged apartments. Red or dark green papers should never be applied in a dark room. These colors absorb light, and add to the natural gloominess of the room in which they serve as decorations. Light blue or pink are attractive in a room which is flooded by sunlight, but they soon fade, thus making papering very expensive, if the home owner desires to have his walls look fresh at all times.

Where pictures are to be hung, a plain background should always be selected, and a garish paper should never be placed in a room that must be occupied by an invalid. Deep borders and ornate friezes should be avoided in small rooms. A common error is to purchase wall paper of a gaudy and novel type, which often spoils the appearance of the furniture.

Paint Required for a Given Surface

In deciding upon the amount of paint required for a given surface, the makers of paints usually advise two coats of ready mixed paint for 200 square feet of surface to the gallon. This is only approximately correct, however, because much depends on the character of the surface to be treated, and the consistency of the paint to be used. Some paints will go much farther than others. It is estimated by some experts that 18 pounds of white lead will be required to make paint to cover 200 square feet of surface. This would indicate 18 pounds of lead to a gallon of paint.

The 1910 catalogue of the J. I. Case Threshing Machine Company, Inc., Racine, Wis., contains a complete description and illustration of the up-to-date products of this concern, notable among which are the "Case" road rollers. The advantages of these machines are their compactness and simplicity in construction. They are equipped with short wheelbase to allow of short turning. Equal power is applied to both rear rollers by means of the spring differential gear. The rolling surface is 7 feet 1 inch wide. Detailed description may be found in the Case Road Roller Catalogue, which may be obtained on application to the company. Another line of special interest is the "Case" sprinkling attachment, for use in connection with the company's four-wheeled engine tender. This has been found most convenient for use in building macadam streets and roads and for other purposes, in that the wide tires do not cut into the unfinished surface of the pavement.

Methods of Laying Concrete Under Water

Detailed Description of Extensive Operations on Quebec Canal System —Construction of Five Miles of Concrete Wall Without Unwatering

(Concluded from last issue.)

Mixing and Depositing Plant—Plate B gives the general arrangement and details of the mixing plant. The plant is shown in place and ready for operation. It will be noticed that the scow is a narrow one, and that the overhang platform carrying the mixer and receiver hopper is partly counterbalanced by the stone and sand bin. The bin had both a sand and stone compartment, the material being taken from the barges alongside by a clam operated by a stiff leg derrick placed at the other end of the scow

Concrete Ingredients and Mixing—The clause of the specification governing the above was as follows:

"Concrete Ingredients—The concrete shall be made in the proportions of one barrel of cement, three barrels of sand, and six barrels of crushed stone, or in such other proportions as may be ordered by the engineer in charge. The sand (provided by the contractor) shall be coarse grained, sharp, and silicious, free from earthy or vegetable matter. A sample of the same which the contractor wishes to provide must be furnished to the superintending engineer before any is brought on the work. The stone ballast (provided by the contractor) shall be crushed hard grey limestone, or "banc-rouge," crushed to pass through a two-inch ring. The run of the crusher shall be used, and the crushed material must be transported and stored so that no earthy or foreign matter of any kind is intermixed. All dirty or unsuitable materials shall be removed from the site of the work as soon as ordered by the engineer in charge."

"Concrete Mixing—The concrete shall be mixed by machine only, except at isolated points, where hand-mixing may be allowed. A Smith mixer, or other approved rotary mixer, shall be used, and each batch of concrete, of the proportions stated in paragraph 5, shall be turned for at least two minutes at the regular speed of the mixer, and continuously, until it is required for the work. No concrete shall be allowed to stand until the initial set has started before it is placed in the wall, and any loss of concrete caused by the setting of the cement owing to slowness of handling, or by spilling due to careless handling, is to be borne by the contractors, who shall also pay for the cement used in each batch of concrete thus lost, etc."

This proportion was usually adhered to, except that a slight variation was made with any change in the sand or the stone provided. The usual mix was about 30 cubic feet of stone, measured loose, 13 cubic feet of sand, and 4½ to 5 bags of cement. This rarely exceeded a yard of concrete when settled in the work.

The sand was usually from the Lake of the Two Mountains, one grade, A, being largely retained on the 50 and 80 sieves, the other, B, being considerably coarser. The latter was chiefly used. The crushed stone used was what is called Potsdam quartz, or Laurentian sandstone. It is hard, creamy white, gritty stone, apparently somewhat porous, but possessing an ideal surface for cement to cling to. The contractors for the work opened up a special quarry at Ile Perrot, where they erected an extensive storage bin with automatic chutes, and were thus enabled to land the material on the work without delays and at a minimum of expense.

Barges holding about 200 tons were employed to carry the stone, and the barges could be filled from the bin direct in about twelve minutes. The haul was about 21 miles. The run of the crusher was always used, as is demanded by all of the Lachine Canal specifications for crushed stone for concrete ballast, the maximum size being about 2 inches. Our experience is that, with probably one exception—viz., a hard, brittle limestone—the run of the crusher, without screening, gives a broken stone that will make the best concrete.

The maximum size of the stone specified is two inches. At times, however, with the Potsdam quartz, flat pieces, longer than two inches, passed through the crusher, and at first were rejected, but after an examination of the wall, it was found that these larger size stones gave a good bond to the mass, especially when worked near the front and at an angle to the wall. The benefit of these long pieces was seen when the wall was examined during the unwatering the following April. At the water-line where any wash occurred the larger stones projected into the mass sufficiently to permit the ballast from becoming loosened and falling down. In fact, these projecting pieces could not be moved, even with a hammer blow.

Cement—Selecting the cement proved a little more difficult than in ordinary work. A number of good Canadian brands were on hand, as usually the Lachine Canal carries a stock of from twenty to thirty thousand barrels in the sheds, but some of the brands gave more even setting results than others. In the laboratory tests these cements all set in about the same time, but varied on the work. This was largely due to the fact that the temperature of the water was changing, being warmer towards summer and colder as the autumn approached. The cement was provided by the department, but the contractors demanded a medium quick-setting cement in order that they might remove the face moulds every three days.

On one occasion, pending the letting of a new cement contract, some English cement was used. This was a first-class cement, but slower setting than the Canadian, and it was found at the end of three days that the concrete was still soft, and the mould could not be moved for a week. All of the cement used, about seventy thousand barrels, was first tested in the Lachine Canal laboratory, in accordance with the standard contract specification, and it was also tested with the sand used and under conditions approaching those of the work. Progressive tests were made with the sand as the various barges were unloaded.

Results of the Work—An examination of the work, after unwatering the canal on the April following the first season's operations, showed satisfactory results, and several points are worth noting. First, that the placing of the concrete had been continued too late in the fall (to October 24th), and as a result of the condition of the water (its low temperature) the concrete of this section, compared with the other concrete, was found to be quite weak. The concrete placed in September had set up hard, and withstood the action of the ice when the water was let out of the canal in April, but the wall placed late in October had grooves cut into it by the ice sliding down, and on this account cost the contractors a considerable sum to refinish the surface.

Second, while some portions of the wall near the water-line had been eaten away by the wash of the waves from passing steamers, and looked rough, it was very hard and firm. The projecting stone from the ballast, particularly some pieces longer than two inches, had secured such a grip in the wall that it was impossible to dislodge them.

The lower portion of the face was quite smooth, but the steps made by each section of concrete laid, as the scow was moved ahead, was discernable. It showed that sections of over eight feet, before moving the plant, were too long. The top surface, usually flooded for a portion of the time after being finished, showed no signs of scumming, but a portion finished late in October one year, followed by rather severe cold in November, was found, after the snow had melted in the following spring, to have peeled to some extent. The warm sun of April, when the canal was unwatered, had the effect of hardening up any portions of the wall that had been delayed in hard set by the coldness of the water.

Laitance, or scumming, of the concrete surface, as described in a paper read before the society last year, has not been found to any extent on this work, either in the locks, basins, or in the general foundation work.

The information thus gained was made use of during the second season of the work. The scow was moved ahead about every eight feet and additional precautions taken to prevent the steamers creating such heavy wave action by making them slow down at a greater distance from the plant. The work was discontinued earlier in October, instead of waiting till the water had become too cold.

On examining the second season's operations on the following April, good results were found all along the wall, and the finish at the bottom was remarkably smooth. The ice had no injurious effect. The stone ballast was exposed in portions of the face, but only slight repairs were required. The action of the ice is one reason for making the concrete facing on the Lachine Canal so thick. About one mile of the concrete facing on the north side was laid with a view to stopping a heavy leakage through the bank. The result was entirely successful.

On the Kaiser Wilhelm Canal, where concrete had been placed on the bank in the dry, "it was noticed, even during the construction of the works, that many of the slabs had hardened only at the surface, and that a year afterwards the lower part was still soft and pasty. This was due to the fact that they were laid upon turf and other soil where there was a discharge of organic acids, which had a tendency to unite with the chalk of the cement in such a way as to make soft soap."

The conditions of the Lachine Canal were not such as to create the difficulty above described. There are no peaty banks, although peat and marl abound in the ground back of the north bank.

A peculiar result was noticed at one portion of the wall A cavity existed under one of the moulds which was missed by the diver. Through this the richer portions of the concrete ran out, and covered about 6 or 8 feet of the bottom of the canal to the thickness of a foot or upwards with a regular mortar. When the section was examined during the following April (1909), the above condition was found, and, strange to say, the mortar was almost in a plastic state, although the portions of the wall above, below, and opposite this point were hard. This mortar hardened up as it became exposed to the air during April, but still was unlike the rest of the wall. The inference from the above, and the rusty color of the mortar, was that, having lost the protection of the face boards, the mortar had, before setting, become affected by some of the discharges into the canal from the mills above and its setting retarded. The other portions of the wall had not been affected, as the forms protected them until the concrete had been set.

Whatever the organic matter was in these discharges from the mills, it had no injurious effects on the walls, although portions of them near the factories are highly discolored.

The Cost of Operating the Plant—An analysis of the cost of the work, to be of value to an engineer, must cover the details of the operating gangs required for each part of the plant, and give the results, the combined units accomplished, in a given time. The cost of materials, sand, stone, coal, oil, etc., will depend more or less on local circumstances, and need not be considered here.

The general experience is that a large plant requires a number of extra men, not usually provided for when the plant is designed. It must also be remembered that the time spent in getting ready and laying up, if the operations go over more than one season, must not be overlooked, as in many cases this is an expensive item, and unusually so with a floating plant in this country.

The gangs employed on this plant were as follows:

Lifting Scow—One foreman, four cranesmen, one diver and two assistants.

Mixing and Depositing Plant—One hoist runner, one fireman, three trimmers for stone and sand barges, one mixer operator, one man measuring and feeding materials to car, one car operator, two men handling cement from barge to

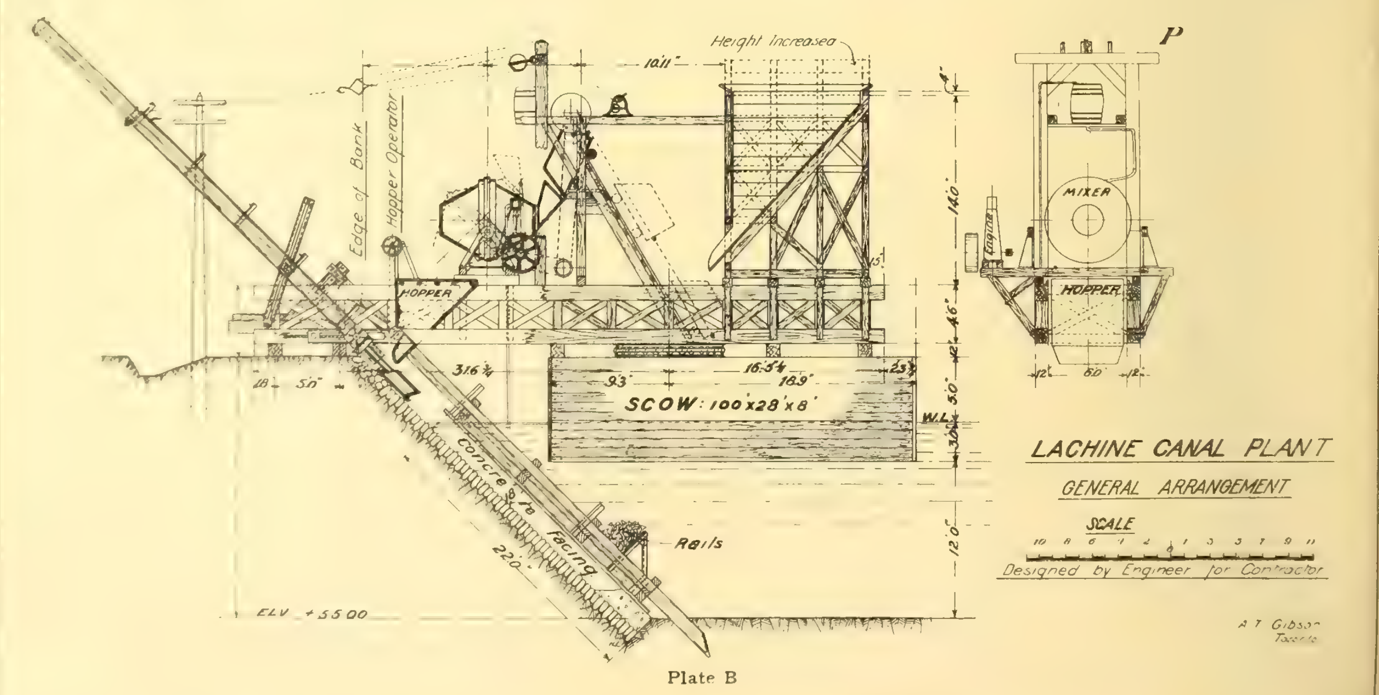


Plate B

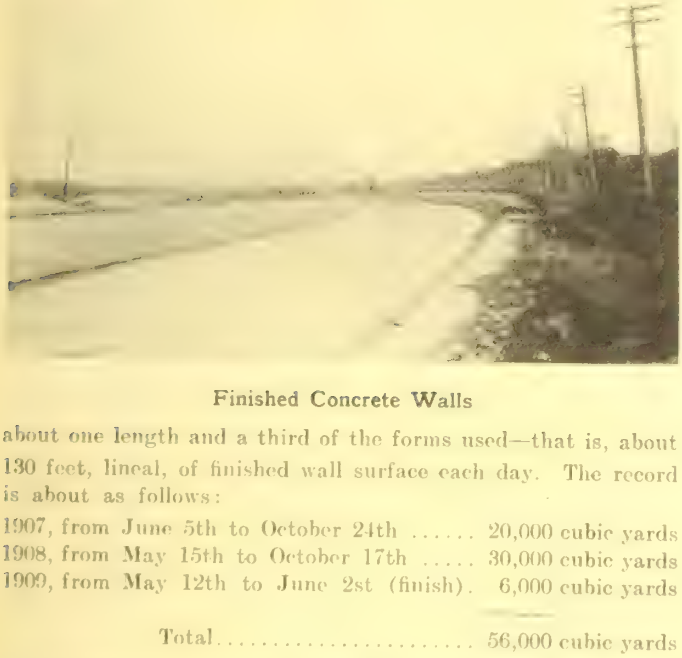
scow, one man opening cement bags, one man feeding cement to car, one operator for ram, one man operating door of bucket, and one man collecting empty cement bags.

Men Employed on Bank and Scows—One carpenter and four helpers for adjusting beam runs and rollers for moving arm of ram, one man levelling concrete surface, one foreman on barges for sand, stone, and cement, and ten men on latter.

Supervising Staff—One general superintendent, one master mechanic, two assistant mechanics, one carpenter foreman. These were all high grade men in their class, and were kept employed on the work about eleven hours each day.

The transportation plant consisted of two tugs, eight or nine barges, including covered-in barges or scows for cement storage, and a barge for coal. The cost of this part of the outfit would be probably charged up to the cost of supplies, etc., and need not be considered here. A small repair gang was generally required, and kept on call for repairing the floating plant. This latter item is one that should be carefully considered and allowed for on similar plants. Some contractors, the author has observed, neglect this, but it was not so with the contractors for this work. One good carpenter and three or four helpers should be provided for the maintenance of a plant of this kind, even if new at the start.

The capacity of the plant averaged about 200 cubic yards per day of ten hours. This was sufficient to fill in behind about one length and a third of the forms used—that is, about 130 feet, lineal, of finished wall surface each day. The record is about as follows:



Finished Concrete Walls

1907, from June 5th to October 24th	20,000 cubic yards
1908, from May 15th to October 17th	30,000 cubic yards
1909, from May 12th to June 2st (finish).	6,000 cubic yards
Total.......................	56,000 cubic yards

The time from the 1st of May in each year till the date of beginning work was spent in getting the plant in commission. This bears out the remarks previously made regarding the cost of getting ready and laying up floating plants.

On the completion of the work on the Lachine Canal the plant was removed to the Soulanges Canal, where the contractors had secured a contract for a similar piece of work. The slope of the walls, however, in the latter case, was flatter than those on the Lachine Canal, but with some slight changes, the author is informed, highly satisfactory work was done.

The author is indebted to Mr. A. T. Gibson, Toronto, member of this Society, the engineer for the contractors, and to Messrs. Haney, Miller, Quinlan & Robertson for permission to use the original drawings of the plant.

The work was carried on under the supervision of the Department of Railways and Canals, through Mr. E. Marceau, the superintending engineer of the Quebec canals, and the author, as engineer in charge of the Lachine Canal.

Mr. Angus W. Robertson was the direct representative of the contractors on the site, and, with the author, was enabled to follow out daily the operations of the plant and the results attained.

Large Masonry Bridge

A bridge which is stated to have one of the longest masonry spans in the world has been built across the River Isonzo on the Wocheinerbahn, the new railway in Austria connecting the interior of the country with Trieste. The bridge has the following dimensions: Span, 268.9 feet; rise, 71.6 feet; radius of intrados, 172 feet; radius of extrados, 190 feet; depth of arch ring at crown, 6.9 feet; width at crown, 18.4 feet; depth of skewback, 11.5 feet; width at skewback, 26.2 feet. The bridge is provided with two viaduct approaches; the northern one is made up of one 39.4-foot and two 32.8-foot arches, while the southern one is made up of three 39.4-foot arches, two 32.8-foot arches, and one 29.5-foot arch. The bridge as a whole has a uniform grade of 0.3 per cent. The material used was limestone from the quarries near Nabresina, which has a mean compressive strength of 17,000 pounds per square inch when tested in 2¾-inch cubes. The mortar used in the joints, which were uniformly about ½-inch wide, was made of one part Portland cement and three parts clean sand. The calculated "maximum" pressures in the arch were 397 pounds per square inch at the crown, 568 pounds at the skewback, and 724 pounds at the joint of highest pressure. The total amount of stone masonry and concrete in the main span was 14,200 cubic yards.

R.A.I.C. Successful

Mr. Alcide Chausse, secretary of the Royal Architectural Institute of Canada, has just been notified that the society's exhibit at the International Congress of Municipal Improvement, held recently in Barcelona, Spain, was awarded an honorary diploma. The exhibit included contributions from the City Improvement Guild, of Toronto, the Architects' Association, of Quebec, and from several landscape architects.

Hints to Non-Advertisers

The man who does not advertise because his grandfather did not, ought to wear knee breeches and a queue.

The man who does not advertise because it costs money, should cease paying rent for the same reason.

The man who does not advertise because he tried it and failed, should throw away his cigar because the light went out.

The man who does not advertise because he doesn't know how himself, ought to stop eating because he can't cook.

The man who does not advertise because somebody said it did not pay, ought not to believe that the world is round, because some ancients said it was flat.

The Power and Mining Machinery Company, Milwaukee, Wis., who make a specialty of completely equipped plants for crushing and handling rock for all purposes, have issued their catalogue No. 4, which covers in a most satisfactory manner the interesting features of design and construction of the company's various products. Noteworthy among the latter is the McCully Gyratory Rock Crusher, a detailed description of which is contained in this catalogue. The illustrations throughout are interesting and informative. The company also manufactures cement-making machinery, power-transmitting machinery, etc., and are prepared to design and build any equipment required for special work.

It is understood that terms have at last been arranged upon which the Exshaw Cement Company, of Calgary, Alta., will join the merger.

Commercial Aspect of Concrete in Canada

Growth of Canadian Cement Industry—Practical Observations for the Contractor—Importance of Judicious Selection of Materials and Accurate Figuring

By Gustave Kahn, Sales Manager, Trussed Concrete Steel Co., of Canada, Limited

That concrete as a building material has passed the experimental stage in modern construction is evidenced by the rapidly increasing number of structures to be found in the civilized world.

Writers of history tell us that concrete, either plain or reinforced, is not a new material and, in support of this statement, point to structures of ancient as well as mediæval days. Be that as it may, our own immediate knowledge of the material is comparatively new; but, new or old, the data to be had relative to the material and its value as a structural material, is to-day just as complete and just as reliable as the data to be had on any other material.

History divides all epochs pertaining to civilization into different ages, and so we may safely conclude that the history of construction should be divided into ages. We have had the age in which stone was used; we have had the age in which wood was used; we have had the steel age; and we are now passing through what, in time, will come to be known as the concrete age.

Victor Hugo has said in his writings that in early history structures of all classes were intended to record the happenings of the day; in other words, to record history. In order for a material to be adopted for structural purposes, its main requisite was quality to withstand the ravages of time.

To-day we look for more. In order that a structural material satisfy the required demands, it must have the enduring qualities required in earlier days, and also must have the virtue of being easily handled in order that it may be commercially economical in its application. This, then, is the primary reason why concrete will naturally come to be known as the building material of the age. There is no known material that will better withstand the ravages of time; furthermore, there is no known material that can be handled more economically.

The Canadian Cement Industry

That Canada is keeping pace with other countries in concrete construction is evidenced by the growth of the entire industry in Canada. Unquestionably the best indication of the industry's growth is recorded by the cement manufactured in, and imported into Canada. Looking into this record we find that during the year 1900 there were manufactured here 292,124 barrels of cement. During the same year there were imported 374,966 barrels of cement. This shows that the total consumption for the year in Canada was 667,090 barrels, of which only 44 per cent. was manufactured here.

During 1909 there were manufactured in Canada 4,089,191 barrels. There were imported 156,456 barrels. The total consumption for the year was 4,245,647 barrels, with the splendid showing that a total of over 95 per cent. was of home manufacture.

The fact that concrete work in Canada compares favorably with concrete work in other countries indicates that the cement manufactured here compares favorably with that of foreign manufacture.

Assuming that, as an average, 1¼ barrels of cement are used to each cubic yard of concrete, we have for the year's work 3,396,500 cubic yards, representing an approximate expenditure of $30,500,000 for the year.

We can congratulate ourselves upon the fact that more than eighty per cent. of all the materials entering into this work was produced in Canada; and I believe that the growth of the industry is such that we are justified in demanding government recognition of the industry.

Review of Last Year's Concrete Structural Work

It is of special interest to note that practically all of the important structural work carried out in Canada last year was either entirely or partially carried out in concrete, plain or reinforced. This statement may be rather broad, but can easily be proven. A hasty review of the situation may not be out of place at this time. To make the review systematic let us begin at the Pacific coast.

The largest building in Victoria for the year, known as the Pemberton Building, is reinforced concrete throughout. All of the larger buildings in Vancouver for the year are either entirely reinforced concrete or are steel skeletons with concrete floors.

Coming on to Calgary, there were erected last year in this city two large reinforced concrete buildings, and in addition steel frame buildings with concrete floors.

Edmonton has been backward, the use of concrete there having been limited to pavements, foundations and concrete floors. Regina, on the other hand, was one of the leaders in this class of construction. The most notable example there are the Saskatchewan Parliament Buildings, almost entirely of reinforced concrete.

Winnipeg was easily the leader. There may be found the Transcontinental Railway shops, almost entirely of concrete. The Fort Garry Terminal Station has a steel frame and concrete floors. The Maltese Cross Rubber Company building is a very large reinforced concrete warehouse. The Government Examining Warehouse is of steel frame with concrete floors. And so on. We learn that Winnipeg alone was responsible last year for about 30 large concrete buildings, not counting the smaller work to be found everywhere. Then there was the large power plant for the city of Winnipeg at Lac du Bonnet, constructed almost entirely of concrete.

We next come to Port Arthur and Fort William. The largest grain elevators in these towns were erected last year in reinforced concrete.

Coming still further east, in and around London may be found any number of good examples of concrete buildings and bridges.

At Hamilton, nearly every building of importance erected during the past year was either entirely or partially of reinforced concrete.

Toronto was a little behind, though it also shows its quota of good work for the year. The fight in Toronto last year in connection with the large trunk sewer there, now in course of construction, should be of special interest. The engineers for the work designed it originally in concrete. The brick industry made a very strenuous fight and succeeded in delaying the award of the contract. Through them the City Engineering Department was compelled to investigate concrete for sewer construction in general, and only after a very thorough investigation were they permitted to adopt concrete.

During 1909, in Peterborough, there were erected a large water works dam and power house. They also started there, last fall, the most important concrete arch bridge yet attempted in Canada.

Belleville and Kingston are well represented in this year's

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* Read at the 2nd Annual Convention of the Canadian Cement and Concrete Association.

work, and Ottawa shows five new reinforced concrete buildings as well as a large concrete grand stand built on the fair grounds.

In giving the number of reinforced concrete buildings, the numerous smaller buildings, such as concrete block houses, erected in this material have not been included.

In Montreal was erected the largest reinforced concrete building put up in Canada during 1909. The structure to which I refer is known as the Jacobs Building. It has a frontage of 237 feet and a depth of 133 feet. At present it is seven storeys high, but eventually this will be increased to ten storeys. Other examples are the Wilder Building, a 10-storey warehouse, and the Ogilvie Building, a large steel skeleton frame with concrete floors. In addition to these, Montreal has a number of smaller buildings erected in concrete during the past year. And so we may pass on to the Atlantic Ocean, and find evidence to substantiate the claims made earlier in this paper.

Practical Observations for the Contractor

The commercial success or failure of the contractor in concrete work is entirely a matter of ability in handling the work efficiently. No greater mistake can be made by the contractor than to attempt to make money on concrete work by scamping the job. Only the best materials obtainable should be used. It is true you may place a certain amount of stone, sand and cement into a mixer, mix it and place it in position to harden or solidify; and a satisfactory piece of concrete may be the result; but if it is, it is merely a matter of chance. On the other hand, if proper precautions are taken, if the stone is clean and of proper quality and size, the sand clean and of consistent quality, the cement sound and of recognized quality, the proper proportions of materials carefully mixed together, the total just as carefully placed in position, there can be no question as to the result. It is a foregone conclusion, not a matter of chance. And so if the contractor is working on reinforced concrete work it is necessary to exercise the same precautions. It is not sufficient to place steel into a bed of concrete and then run chances of the amount, the quality or shape of steel being right. There is only one proper way, and that is to analyze or diagnose the case. Be sure that all possible conditions have been considered, such as the known load that the structure is to sustain and the greatest possible load that it may be called upon to sustain. Analyze the stresses these loads will produce on the concrete as well as on the steel and make sure that the quality and quantity of the concrete, as well as those of the steel, are sufficient to take care of this load. Make sure that the concrete will be called upon to take care of only the stresses it is known it can resist. (Compression). Be sure that the distribution of the steel throughout the mass is in accordance with the stresses distributed throughout the mass. In other words, be sure that all compression, all tensile, as well as all shearing stresses are provided for. Then exercise the proper precautions in combining the proper materials, and the final result spells success.

Essential to Figure Costs Accurately

No contractor can become a permanently successful business man unless he does good work, and at the same time makes money. It therefore only follows that a successful concrete contractor must do good concrete work and must make money.

According to my former statements, if all necessary precautions are taken in designing, planning, inspecting and performing the work, the final result regarding quality of work cannot be questioned. The only thing that remains to be considered from a business point of view is how to make money. To this there is only one answer. Learn to figure costs. Do not undertake a contract unless you can see that the price to be obtained will provide a profit. It may seem strange but it is true, that the differences of opinions regarding cost among contractors are just as great as the differences of opinions among lawyers, regarding matters of law, or among doctors pertaining to matters of medicine. Only careful study and long experience will perfect the contractor's judgment in this regard.

There are always, or should be, certain positively known facts. These are the cost of the required material, the cost of transporting these materials to the site and the overhead charges, or cost of looking after the routine business in connection. Then comes the cost, or probable cost, of equipment required, and last, but by no means least—rather the greatest—the cost or probable cost, of the required labor. If the plans are prepared properly, the cost of the materials is usually only a matter of plain addition and multiplication. Right here, I would ask you to observe that this statement is modified. The plans must be properly prepared, and that means a lot. For plans to be properly prepared, they must show the most economical known way to accomplish certain results. By this is meant that every particle of material shown on the plan must, when incorporated in the work, perform a certain needed function in such a manner that the full strength of the material used is developed; and further, that only materials especially suited for certain functions are to be employed for the said duties.

Careful Selection of Materials

The statement has often and truly been made that every dollar judiciously spent in planning work will save two dollars in carrying out the same. This principle also holds true in the careful selection of the materials to be used. Usually, the low unit cost of raw material is not a criterion of careful planning. For instance, if all the materials required in a structure cost the contractor $10 and the labor required to place this material into the structure cost an additional $10, the resultant total cost being $20; and if differently prepared materials will cost $12 and the required labor in the latter case $6, the second material is unquestionably more economical, and the engineer who prepared the plans specifying these materials has proven his right to his title. The overhead charges in any business are usually the result of business system; the better the system employed, the lower the cost of the result of paying. The cost of labor is usually reduced in direct ratio to the care exercised in planning the work, selecting the materials and selecting the equipment for handling.

A Summary of Practical Pointers

To be successful as a contractor in concrete work, plan the work in a careful manner and select carefully the materials to be employed in the work. Do not employ the materials whose first cost is the lowest but the materials that are most economical in place, and which, when properly prepared, reduce the chance of error to a minimum. Simplify field labor as much as possible and, above all things, refrain from taking contracts so low that when the work is finished and the bills are paid nothing remains to recompense you for the energies expended in carrying the work to completion.

We are all working, or should be working, for a common cause, the success of the cement and concrete industry. Remember that every bad piece of concrete work injures not only the contractor who performed the work, but the entire industry; so for this selfish reason, if for no other, it is up to us to assist one another in handling successfully all our contracts. In our own interest we cannot afford to knock our fellow concrete contractor. We must boost him.

The Hanbury Manufacturing Company, whose head office is at Winnipeg, announce that they will at once double the capacity of their whole establishment, factories, mills, warehouses and offices, which will result in hundreds of extra hands being employed and thousands of dollars worth of new machinery being installed. The company expects to have these improvements completed by June 1st.

Conclusive Experiments with Cement Tile

Particulars of Careful Tests and Practical Information of Much Interest to Cement Users—Cost of Hand Made Tile[*]

By Professor W. H. Day, Guelph, Ont.

Since the Ontario Agricultural College began college extension work on the subject of farm drainage some five years ago there have been numerous enquiries for information on the subject of cement tile. People usually wanted to know two things, first, whether the cement tile could be made cheaper than the clay tile, and secondly, whether they would be durable. When these enquiries first began to come in there were not, so far as I am aware, any extensive or conclusive data as to the durability of cement drain tile, nor was there any grave question about their durability. There was a general impression, however, that they should prove durable, judging from the manifold conditions in which concrete had proven its usefulness. Therefore, at first we concerned ourselves with the cost of manufacturing cement tile by hand, for the point made by most of the enquirers was that they were thinking of procuring moulds and making their own tile.

For use in our experiments on the cost of manufacture, the London Concrete Machinery Company furnished us with one of their two-piece cement tile machines, since taken off the market. And the experimentation was undertaken by Mr. A. M. Shaw, one of our students, who had had considerable experience in cement work with his father, the late Mr. Robert Shaw, of Niagara Falls, Ont., who for several years did much of the road contracting in his locality. During the months of April and May, 1908, experiments were conducted in making cement tile.

While writing the report of these experiments in the latter part of the year, we learned of the controversy over the durability of cement drain tile, and we must confess that the idea of cement being soluble was a new one to us. After reading the attack on cement and the answer to it, we counselled our farmers to go slowly in the adoption of cement tile, believing that the uncertainty, in our own minds at least, about their durability was sufficient to warrant such action. At the same time, however, we decided to conduct some tests in order to learn for ourselves something about the solubility of cement, and to deduce from the information thus obtained some idea of the probable durability of cement tile. These experiments were begun in February, 1909, and have been continued until the present.

Besides the points already mentioned, the porosity of cement tile received some attention during our experiments.

The Cost of Making Cement Tile by Hand

The tile made by the London two-piece machine were hexagonal on the outside, being about three-quarters of an inch thick in the thinnest part and considerably thicker at the corners. Mr. Shaw found that, mixing his own material he could make a shade over 500 complete three-inch tile in a day when everything was once in order. The material had to be mixed quite dry in order that the moulds might clean, so dry, indeed, that it was impossible to tamp it close enough to make a compact tile. By oiling the moulds it was found that the material might be mixed much wetter, but still not wet enough to make what we consider a good tile. We also thought that considerably more material was used in these tile than would be necessary for a round tile; and besides, the amount of handling required for two-piece tile was double that for one-piece. These features led us to doubt whether this type of machine would ever be popular with the farmers. On consultation with the company we found that they had arrived at the same conclusions, and that they were withdrawing the machine from the market. These circumstances at first led us to think that the work done on this phase of the problem was of little practical value, and we discouraged the extensive publication of the results, although we placed them in our annual report, just as a matter of record. On second thought, however, we have changed our minds somewhat, for the following reasons: The rate of manufacture determined must represent fairly well what might be expected with a round-tile machine of similar dimensions—the round tile would be slower to tamp but there would be only half as many pieces to handle. And as a matter of fact we have since learned of a hand machine for round tile, recently invented, on which one man can make about 500 tile a day, thus establishing that the rate of manufacture determined in our experiments is in all probability a fairly representative one.

We found further that 6 cubic fet of sand and 1 bag of cement (approximately a cubic foot) would make 78 complete 3-inch tile. But a round tile ½-inch thick requires only 55 per cent. as much material as the one made on the London two-piece machine, hence the material mentioned above would make 100/55 x 78, or 142 tile, providing they were tamped to the same compactness. As they could be made wetter, they would likely be somewhat more compact. This, however, would be counterbalanced by the use of another half-bag of cement, making the proportions 4 of sand to 1 of cement (6 to 1 is too poor for really strong tile), so that we may fairly assume from our figures that from 6 cubic feet of sand and 1½ bags of cement there can be made 142 three-inch tile, say 140 in round numbers. This gives us a means of arriving at an estimate of the cost of making 3-inch tile, ½-inch thick, by hand, when the price of material is known. In Guelph we pay $1 a yard for sand and $1.90 for cement. At these prices

6 cubic feet of sand cost	$0.22
1½ bags of cement cost	.71
Total price of material for 140 tile	.93
Total price of material for 500 tile	3.32
Wages of man for one day	2.00
Total cost of 500 tile	5.32
Total cost of 1,000 tile	10.64

In this estimate no allowance is made for hauling the material, as this can be offset against the hauling of clay tile, if it is desired to make a comparison between the cost of the two kinds.

The prices used in the estimate may be high in some localities, but knowing that 6 feet of sand and 1½ bags of cement will make 140 tile, and that a good man can make about 500 tile a day on certain types of machine, the cost of manufacture may be figured out to suit cost of materials in various localities. Or again, if type of machine is such that a man can make only 400 instead of 500 in a day, the cost of the tile can readily be calculated.

Next we come to the solubility tests.

EXPERIMENT ONE

Sample—A piece of cement tile weighing 43.256 grams after being dried to constant weight at 215 degrees F. This tile was made by the "dry process' in April, 1908, in proportions 6 of sand to 1' of cement. For a few days after being made it was watered daily, and then it was submerged in water for a period of six weeks, after which it was removed and transferred to a storage cellar, where it remained until solubility experiments began. Tile quite porous.

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[*] Read at the 2nd Annual Convention of the Canadian Cement and Concrete Association.

Treatment—After the small piece had been dried to constant weight it was placed in distilled water for four days, then removed, dried, weighed, and again placed in fresh distilled water. This was repeated 16 times, the total period of solution being 143 days and the total loss in that time was .113 grams. The total cement in the sample was 7.1794 grams, hence at this rate the cement would all dissolve in 27.7 years.

The experiment was next performed with water from the artesian wells at the College. This water is high in total solids, about 460 to 480 parts per million, made up chiefly of bicarbonate of calcium, bicarbonate of magnesium, or the compound bicarbonate of cacium and magnesium. There is also a small amount of chlorine in it. The sample was tested five times in this water, the total period of solution being 47 days and the total loss in weight .090 grams. At this rate it would take only 10 years to dissolve all the cement in the sample.

EXPERIMENT TWO

Sample—A piece of tile, proportion 6 to 1, made on London two-piece machine, May, 1908, watered daily for a week after making, stood in cellar till November, 1909, mixed much wetter than sample used in experiment one, so wet indeed that the moulds would not clean well. Dry weight, 43.213 grams.

Treatment—Same as sample in experiment one, only the number of tests in distilled water numbered 8 instead of 16, the total period in the water being 73 days. During the period the sample lost .025 grams, at which rate it would take 57.4 years to dissolve all the cement in it. When put in the well water the loss in 47 days was .090 grams, which rate would use up all the cement in 10.3 years.

EXPERIMENT THREE

Sample—A piece of wet mixed tile, made the same time as number 2 and watered and stored in the same way. Dry weight, 36.2795 grams.

Treatment—Distilled water for 73 days, well water for 47 days

Result—This sample lost only slightly in distilled water, and gained .0333 grams in well water. At this rate it would last for ever

EXPERIMENT FOUR

Sample—A piece of tile, proportions 4 of sand to 1 of cement, made by Mr. George Holden, of St. Marys, on the London automatic cement tile machine. Watered daily for a week after being made, and then stored in our laboratory until October, 1909. Dry weight, 20.4792 grams.

Treatment—Same as in 2 and 3.

Result—Loss in distilled water in 73 days, .0387 grams. At this rate the sample would last 26.5 years.

In well water the total loss was .130 grams in 47 days, at which rate the sample would last only 5.1 years.

EXPERIMENT FIVE

Sample—A piece of tile, proportions 4 of sand to 1 of cement, made by same maker as No. 4, cured and stored in the same way. Dry weight, 35.781 grams.

Treatment—Same as others.

Result—In 73 days in distilled water the loss was .0175 grams at which rate the sample would last [illegible] years. In 47 days in well water the sample gained [illegible] grams in weight and thus would never disintegrate.

EXPERIMENT SIX

Sample—A piece of clay tile about average quality, possibly burned a little hard. Dry weight, 30.[illegible] grams.

Treatment—In distilled water 48 days, weighed 5 times; in well water 47 days, weighed 5 times.

Result—Loss in distilled water, .159 grams, at which rate the sample would last only 4.1 years. Loss in well water, .081 grams, at which rate the sample would last 58.3 years.

In estimating the time that samples would last it has been assumed that they would be subject to solution 365 days in the year and that the rate of solution would be uniform. The first of these conditions certainly would not hold in practice. During a large portion of the year, possibly half, tiles are dry and not subject to solution, and consequently would last twice as long as the periods mentioned, provided the rate of solution during the other half of the year was constant.

Three other experiments were performed which probably come nearer natural conditions than the previous experiments do. Three half tiles were placed in running well water on May 6th, 1909, where they have been ever since. At the end of six months they were dried, weighed and replaced in the water. Then last week they were dried and weighed again. The results are as follows:

EXPERIMENT SEVEN

Sample—A half tile, proportion 6 to 1, made on London two-piece machine, dry process, May 1908, watered for a week, stored in cellar. Dry weight, 1797.5 grams.

Treatment—In running well water for 10½ months, weighed at 6 months, and at 10½ months.

Result—Tile gained in weight each time. Total gain, 3.1 gram.

EXPERIMENT EIGHT

Sample—Same as in 7. Dry weight, 1910.25 grams.

Treatment—Same as 7.

Result—No change in weight in first six months, a gain of 4. grams in next 4½ months.

Thus these two samples would never disintegrate at this rate.

EXPERIMENT NINE

Sample—A half tile, proportions 6 to 1, made on London two-piece machine, made very wet, so much so indeed that tile would not hold shape, and moulds would not clean. Allowed to dry, getting a few showers of rain, and then stored in cellar. Dry weight, 2001.0 grams.

Treatment—Same as in 7 and 8.

Result—Tile lost 1.90 grams first six months and 2.70 grams next 4½ months. At this rate the sample would last 63.4 years.

It is worthy of note with regard to these three samples, that those made by the dry process, and therefore very porous, were the ones to gain in weight, while that made by the wet was the one to lose.

The behavior of these three large samples contrasts so strongly with that of the small samples as to indicate that experiments with small pieces are apt to be very far from actual conditions. For instance, the rate of solution for the piece of clay tile would indicate that that sample would all dissolve in less than two generations. And in much less time than that the tile would be so weak as to give way under soil conditions. Experience has shown that such does not occur, and hence we must conclude that the conditions are so artificial that it is not safe to base arguments as to durability upon such tests.

Porosity

With regard to the porosity, we find that it varies with the proportions of cement, with kind of sand used, and also with the method of making. The more cement used the finer the sand or the wetter the mix, the less porous the tile. But even the most compact ones tested were much more porous than clay tile

Tests of Materials Used for Sewer Inverts

Conveying Useful Information as to Relative Durability of Materials and Cases Where Increased Cost is Justified—Examples from Modern Practice*

By E. S. Rankin, Engineer of Sewers and Drainage, Newark, N. J.

In examining brick sewers built 20 to 30 years ago it frequently happens that the bricks in the invert are found nearly or quite worn through. This is particularly noticeable in sewers with a fairly steep grade and carrying a considerable amount of street wash. I have in mind particularly one sewer about 6,000 feet in length, built in 1873, where practically the entire invert has had to be renewed, a troublesome and expensive operation. The following quotation is taken from Folwell's "Sewerage": "A $5\frac{1}{2}$-foot two-ring brick sewer in Baltimore, 25 years old, was recently found with its invert in one place cut completely through for a width of 12 to 15 inches, and badly worn for a height of 2 feet. In Omaha's brick sewers, the wear, which is usually 18 to 24 inches wide, became 2 to 3 inches deep in 12 years."

Brick-Lined Concrete Sewers

In order to avoid this trouble it has been our custom, for a number of years past, to line the lower third or quarter of the sewer with vitrified paving brick. The only test required for these paving brick in our specifications is that they shall not absorb more than 2 per cent. of their weight in water after being thoroughly dried and then immersed for 24 hours. Is this test a criterion of their wearing qualities in the sewer? And is the life of the sewer increased sufficiently to warrant the extra cost? Within the past few years we have also built a number of concrete sewers, lining their inverts also with paving brick. The writer has heard the statement made that on some of the very steep grades in Duluth, sewers were found in which the brick was nearly worn away, but the cement joints were left with almost their original thickness. If this is the case, is a vitrified lining necessary in concrete sewers? Another question along the same line is the relative wearing qualities of a concrete as compared with a vitrified pipe. The following experiment was made in the hope of throwing some light on the above questions.

The several samples selected were first tested for absorption and then placed on a rubbing bed such as is used in stone yards for smoothing blocks of stone. They were all given a uniform weight of 20 pounds and were left on the bed for 30 minutes. The velocity of the bed on the line on which the samples were placed was 21 feet per second.

The results are shown in the accompanying table. Nos. 1 to 4 were vitrified shale paving brick selected for their variation in absorption. No. 5 was a small shale brick made for use in sewers. Nos. 6, 7 and 8 are different makes of building brick also selected for their variation in absorption. Nos. 9, 10 and 12 were made from the mortar and concrete being used in the construction of a sewer at the time the experiment was made and were tested when 18 days old. No. 11 was a section of concrete pipe furnished by the Lock Joint Pipe Company, of New York, and was approximately one year old. No. 13 was a tile used by the same company for lining their pipe where required by engineers. Nos. 14 and 15 were both samples of vitrified salt-glazed sewer pipe.

The second column of the table, percentage lost by abrasion, was obtained by dividing the weight lost on the bed by the original weight, assuming each sample to be of a uniform size, 2 x 4 x 8 inches. The last column assumes arbitrarily the life of the softest sample, No. 8, to be 10 years, and calculating the others from this.

Tests of Brick on a Rubbing Bed

No.	Material	Per cent. gained by absorption.	Per cent. lost by abrasion.	Ratio of abs'p't'n to abr's'n	Life of invert years.
1	Vitrified shale brick	1.36	2.00	1:1.47	324
2	Vitrified shale brick	2.15	3.35	1:1.56	193
3	Vitrified shale brick	3.60	3.42	1: .95	189
4	Vitrified shale brick	4.28	5.92	1:1.38	109
5	Shale sewer brick	13.18	27.31	1:2.07	24
6	Building brick	7.39	20.41	1:2.76	31
7	Building brick	10.19	44.74	1:4.39	15
8	Building brick	18.91	64.74	1:3.42	10
9	1:2 Cement mortar	11.86	4.41	1: .37	147
10	1:2:4 Gravel concrete	6.65	3.82	1: .57	169
11	1:2:4 Gravel concrete	5.10	3.35	1: .66	193
12	1:2:5 Stone concrete.	7.40	8.62	1:1.16	75
13	Vitrified tile	1.34	4.47	1:3.34	145
14	Vitrified pipe	4.47	6.11	1:1.37	109
15	Vitrified pipe	1.72	4.55	1:2.65	142

While this experiment is not to be considered by any means as giving absolute results, it appears to show:

First, that for similar materials, although there is a considerable variation in the ratio, the abrasion in every case with the exception of No. 12 increases with the absorption, and hence the absorption test gives a fair idea of the wearing quality of the material.

Second, the additional cost necessary to line the invert of a brick sewer with paving brick is certainly warranted, although the 2 per cent. test required by the Newark specifications seems unnecessarily severe.

Third, the concrete samples compare favorably with the paving brick and it would, therefore, seem unnecessary to line a concrete sewer. The behavior of the mortar sample also bears out the statement as to ordinary brick wearing away faster than the cement joints. I am unable to account for the low figure shown by the stone concrete. The sample was made at the same time as Nos. 9 and 10, with New Jersey trap rock.

Fourth, the pipe is apparently not quite as durable as good concrete pipe and the use of the lining tile is superfluous.

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* Read before the American Society of Municipal Improvements.

Mr. Fuller, of the firm of Fuller & Herring, New York, will probably submit his report within the next week in regard to the subject of establishing a filtration plant for the city of Montreal.

The Canada Paint Company, Montreal, have issued a circular announcing a new price list and catalogue which will take effect upon the second of May. Liquid paints and kindred lines will be advanced 10c. a gallon, and all articles, in which linseed oil figures as a component part, also increased in value.

Canadian City Engineers

Mr. Mason H. Baker, St. Thomas, Ont.

The new assistant city engineer of St. Thomas, Ont., Mr. Mason H. Baker, is to be congratulated upon obtaining a responsible post with excellent prospects at such an early stage of his career. Mr. Baker is essentially of the younger generation of engineers. St. Thomas is his native city and he lived there until he entered the School of Practical Science, from which he graduated in civil engineering in 1906. A year later he completed his post graduate course and obtained the degree of B.A.Sc. Since that time Mr. Baker has seen useful service with the Public Works Department of Saskatchewan, and later with the John S. Metcalf Engineering Company on the construction of the G. T. P. elevator at Midland. During the past year Mr. Baker has been engaged in the survey of Dominion lands in the Peace river district. He is duly qualified as an Ontario and Dominion land surveyor. The present city engineer, Mr. Jas. Bell, whose ability is widely recognized in professional circles, is retiring at the end of the present year in order to devote his whole time to private practice.

Mr. Mason H. Baker, who was recently appointed Assistant City Engineer of St. Thomas, Ont.

Comparative Tests of Clay and Cement Products

It is doubtful if any comparative tests of clay and cement products for the purpose of ascertaining their relative values, are of much merit because of their entire unfairness to clay products, says a writer in "Brick." This unfairness consists:

First, in the fact that the samples of clay tested are a finished product, standard in character and taken from a stock representing a uniform and stable product.

Second, the samples of cement product tested are usually made especially for the purpose under the most favorable conditions and in the most careful manner, and are not representative of the ordinary material in practical use and cannot represent a product of standard or stable character uniform in quality. There is a new concrete system bobbing up every day and of course it hops up on some convenient fence, flaps its wings, squeezes out an adolescent crow or two and forthwith "challenges" the clay people to a battle royal, a test forsooth! And what does a laboratory test amount to after all? The cement is carefully selected, the stone and everything else minutely measured and mixed. O yes, those tests loom up remarkably well for all the concrete systems. The real test is made by a colored gentleman and a wheelbarrow. That's the concrete work that people have to stand for. A real live fire is the test that is worth something. Go back a bit and see how well those wonderful concrete buildings (that exist so largely in the imagination of certain unprejudiced experts) stood the test at Baltimore and at San Francisco! Poorly done as was much of the old tile work in both those cities, its record is virgin white compared to the performance of some of those other wonderful systems there illustrated. If the clay people answer every challenge made them and go to the trouble of a test every day or two they'll soon have no time to carry on the work of properly fireproofing the majority of the fireproof buildings now being erected.

Mr. Gordon E. Perry

General Manager, National Iron Works, Limited

Many of our readers will be interested in an introduction to Mr. Gordon E. Perry, who has been appointed general manager of the National Iron Works, Ltd., Toronto, a concern which is entering the contracting field under the most favorable conditions. One of the most up-to-date plants of the kind on the continent has been erected on the now famous Ashbridge's Bay site, where the manufacture of cast iron pipe for various purposes has already been commenced on a large scale.

Mr. Perry was born at Dundas, Ont., but has spent the greater part of his life in Toronto, where he was educated. In 1900 he entered the employ of the Canada Foundry Co. Ltd., then on Berkeley St. Toronto. Here he remained for some time at the works, afterwards being promoted to the sales staff and finally being appointed special agent and manager of the company's Ontario district office, a position which he retained until 1909, when he severed the connection to become associated with the National Iron Works. Though still a young man Mr. Perry has had a wide and varied experience in the iron business. With such advantages he is admirably adapted for the position he now holds.

Mr. Gordon E. Perry, General Manager, National Iron Works, Limited.

Rough Face Brick in Architectural Work

Practical Brickmaker Reviews the Situation and Offers Some Noteworthy Suggestions — Interesting Pointers for the Manufacturer

At one time the wave of dry-pressed products swept over the country and with the variety of color there was given the architect a mechanically perfect block of burned clay, and we regret to say that many architects made use of it, to the architectural elimination of the mortar joint, which is an important feature of any brick wall, says a brickmaker writing in a recent issue of the "Architect and Engineer." Bricks are bricks and must be laid in mortar; therefore if a truthful brick wall is to be built, the mortar joint should be a part of it. We fear that there is a present tendency to go to the other extreme and consider mortar as the building material, in which bricks are to be laid. There are extremists in everything and perhaps they add something to the betterment and beauty of the world. We do not know. But somehow we cannot help saying "amen" to the wish that some of the architectural freaks had died in infancy.

We not only gave the architect a great variety of colors, but we gave him variation in size. To the Standards we added "Romans" and "Normans." The colors the several sizes, together with the possibility of different bonds, gave the architect opportunities he had never known before. Our cities, architecturally, took on a new light and life and color of which we had never dreamed.

We did our part toward a more beautiful city and the architect his, but the brickmaker and the architect alike failed to consider the most essential element in building architecture, the effect of time, the problem of "growing old beautifully."

Is this a lost art in architecture? Did the ancients understand how to build for all time? They lived longer than we do and had better opportunity to study the effect of time. Or was it because their materials were nearer nature than ours—everything hand-made? We can not say, but we know that our beautiful buildings became streaked with dirt and hideous in a decade. It was no longer a question of "undertones of pink," but of the original surface color.

The manufacturers of light colors began to mottle the bricks — "mottled," "speckled," "iron-spot," etc., to break up the color and in an effort to make the bricks dirtproof. It was about this time that the influence of stiff-mud bricks began to be felt in the market. Also enamelled bricks were under serious consideration by many manufacturers, but architects would not have enamelled bricks as a general facing material.

The demand for a material which would not show dirt became insistent. There was a notable adoption of darker colors and rougher shades, and paving brick became a feature in the market. The latter certainly does not show dirt, and aside from that, surely deserves a place in our building scheme, but it could not fill the place of the brighter colors.

There was an attempt by the dry press brick manufacturers to introduce rock-faced bricks, but it failed because the architects would have nothing of it. It was a noble building material debased into an imitation of another noble building material. Possibly a more extended use of rock-faced bricks would have led us sooner to recognize the merits of rough-faced products.

Texture an Important Consideration

Texture is wherein we have failed to meet the requirements of the architects, and texture is a very important element. Why put burlap on our walls? As well use a smooth paper printed to imitate burlap.

A printed or painted cloth on the floor would soon hide its color and design in dirt, while a rough-coated tapestry will hold the design and color to the last rag, and if it be a Persian rag it will still command a high price in America. It is the tapestry idea that we need in brick—not the color effect, but the texture.

We have heard the cry of "fad" against the rough effects that are now coming out, but they are not fads. They have come to stay and multiply.

What we are after are effects of light and shadow, and not visible roughness—at least not visible at the distance from which the wall is viewed. We wish to break up the smooth, brilliant colored surface and give softness, and in doing this we bring out the depth of the color and its true life by the contrast of light on the high points and shadows in the depressions. Quoting from a German article: "Smoothness in brick surfaces eliminates the play of the light and shadows which is essential to the enlivenment of the surface and prevents softening of the too strong colors on the one hand and the animation of the gloomy on the other hand." If manufacturers will keep this in mind there will be produced fewer of those freak products, whose only excuse for existence is that of roughness. Such rough effects, whose only merit is roughness, may please us for to-day, and we bear with them to-morrow, but on the third day we would relegate them to the ash heap if we could.

The wire-cut face brick—we mean a stiff-mud brick with a wire-cut face—has developed wonderfully in this country, and a number of factories are making it almost exclusively. The same brick is being experimented upon in Germany, but with no marked success up to the present time.

The wire-cut face is especially pleasing. There is nothing mechanical about it. The wire dragging through the clay roughens up the surface in a series of ragged corrugations, and no two bricks have the same light and shadow effects. At first a great deal was said about the dirt that such a surface would accumulate. The product has been on the market about six years, and the first buildings constructed show no evidence of getting dirty, and it is believed the bricks will hold their color-effect longer than a smooth-face brick. The softening and blending effect of time which should enhance the beauty of the wall will deal kindly with this product.

Some little time ago trouble developed between the Carpenters' Union and the Master Builders at Hamilton, Ont. A compromise is likely to be arrived at as the builders hold the stronger position. The carpenters wanted an increased wage scale to go into effect on May 1st, but the builders have been hiring non-union men and there are at present in the city a great many first class carpenters who are not affiliated with either of the local unions. They are willing to work for the minimum wage of 35 cents an hour, while the union men want 37½ cents. Many of the non-union men have been taking contracts for themselves and working Saturday afternoon and evenings on them.

Pennsylvania R. R. Terminal

THE Pennsylvania Railroad Terminal in New York City is the central feature of an improvement whose total cost will reach $100,000,000. It is a magnificent structure built for efficiency, almost regardless of cost.

It is covered with a Barrett Specification Roof with vitrified tile surface.

Would such a roof have been used on this magnificent, modern, fireproof structure if anything better could be obtained at *any* price? Surely not.

The fact is, a Barrett Specification Roof is the most economical roof covering yet devised. And it has a record of fifty years of satisfaction behind it.

In addition to the great roof, the foundations are waterproofed with Coal Tar Pitch and Felt—the same materials as are used in Barrett Specification Roofs.

In a small part of the first section of the tunnel a substitute for pitch was tried but quickly abandoned.

About 4,000,000 pounds of Barrett's pitch were used for underground work and roofing.

The Barrett Specification should be in the hands of every architect, engineer and owner of buildings. Copy of it free on request.

Paterson Manufacturing Co., Ltd.

Toronto Montreal Winnipeg Vancouver St. John, N. B. Halifax, N. S.

Personal News and Notes

Mr. E. Whitby has been appointed assistant city engineer of Hamilton, Ont.

The Western Canada Cement & Coal Company, commonly known as the Calgary Company, is stated to have been absorbed by the Canada Cement Company.

Building Inspector Rogers, of Winnipeg, Man., celebrated the 31st anniversary of his arrival in the city last week. He has been connected with the Winnipeg council since 1880.

The Winnipeg Painters' & Decorators' Union expect to sign up a new agreement for 40 cents an hour, prior to May 1st. Incidentally, a shortage of painters is reported at Winnipeg.

The Canada Cement Company are stated to be contemplating the erection of a large cement mill in Manitoba. It is not yet decided whether to install the plant at Winnipeg or farther west, where the raw material is secured. The location will depend upon freight rates.

Owing to the passing of a law making considerable changes in sanitary regulations at St. John's, Nfld., over $100,000 worth of sanitary appliances, pipe, plumbers' supplies, etc., will be required in that city within the next year. The bulk of this will undoubtedly come to Canadian manufacturers.

It is probable that the position of Chief Engineer of the Department of Railways and Canals at Ottawa, made vacant by the resignation of Mr. M. J. Butler, will be filled by Mr. W. A. Bowman, who has recently been acting in that capacity and who has been connected with the engineering branch of the department for five years.

The Late Mr. Stanislas Gagne

Mr. Stanislas Gagne, of the firm of Gagne & Jennings, consulting engineers, Toronto, who met his death last week in a landslide which occurred near St. Alphonse, Que., in the construction of the Ha-Ha Bay Railway, was only 31 years of age. He graduated from the School of Practical Science, Toronto, and at once became associated with the late Mr. W. T. Jennings, city engineer of Toronto. Mr. Gagne was chief assistant on the Niagara power construction work. Later he formed a partnership with Mr. Gordon T. Jennings, and had an office in the Lawlor Building, Toronto, the firm name being Gagne & Jennings. Upon securing the contract for the Ha-Ha Bay Railway the firm made its headquarters at Chicoutimi, Que. The late Mr. Gagne was regarded as one of the most promising of the younger generation of civil engineers and his untimely death is much to be regretted.

An Interesting Announcement

Mr. Willis Chipman, consulting civil and sanitary engineer, Toronto and Winnipeg, has taken into partnership Mr. Geo. H. Power, who has been associated with him since 1901. The new firm will make a specialty of municipal engineering work. The partnership will enable the senior member of the firm to devote more of his attention to consultation work. Mr. Chipman has a national reputation in problems relating to municipal engineering, particularly in regard to waterworks, sewerage and sewage disposal. Mr. Power has also seen some useful service in the same line, having been resident engineer on the waterworks and sewerage systems at Port Arthur, Ont., Campbellton, N.B., and Prince Albert, Sask., in addition to having served as chief assistant to Mr. Chipman on several smaller systems.

Annual Meeting Calgary Builders' Exchange

There was an attendance of about 60 at the recent annual meeting of the Calgary Builders' Exchange. The following officers were elected: President, R. A. Brocklebank; 1st Vice-president, R. J. Priestly; 2nd Vice-president, H. H. Movers.

Plans for Public Buildings

Mr. F. S. Baker, president of the Royal Architectural Institute of Canada, has written to Sir Wilfrid Laurier urging the desirability of employing leading architects in private practice to design important government buildings. Mr. Baker concludes as follows:

"The design produced by the architectural staff of the Department of Public Works has now been published, and I submit that for its purpose it is a travesty on good architecture. If it was intended for a Salvation Army barracks or a tobacco factory, this criticism might not be reasonable, but for a building to house the official departments of the Government of an advanced country, I submit the design is absolutely unsuitable and calculated to increase in the minds of cultured persons the inferiority of Canada in art."

Builders' Exchange Organized at Prince Rupert, B.C.

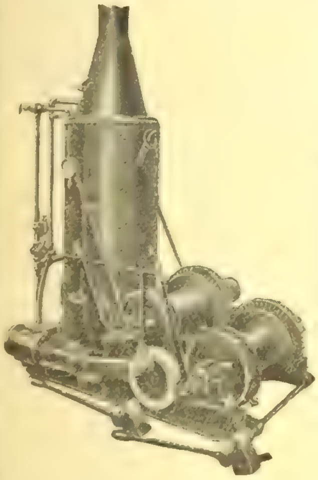
At a meeting of master builders and contractors held at Prince Rupert last week the organization of the Prince Rupert Builders' Exchange took place. The following officers were elected. President, P. W. Anderson; Vice-president, A. J. Prudhomme; Secretary-treasurer, D. H. McInnis. On account of the conditions under which building has to be carried on at Prince Rupert, it was decided by the exchange that nine hours should constitute a day's work, with $5 per day as the maximum wage. On account of the short days during the winter months, the working hours had been reduced to eight hours; but the exchange have decided to take advantage of the longer daylight of the summer months and work nine hours per day.

Town Planing and Civic Improvement

In view of the recent passing into law of the Housing and Town Planning Act, 1909, the Royal Institute of British Architects has decided to organize a conference to study the architectural problems involved in the improvement and extension of cities. This conference will be held in London from the 11th to the 16th July, at the Royal Institute, London. The King has extended his patronage to the conference. The programme will include an exhibition of drawings, plans, models, and literature bearing upon the subject, and a large number of town plans and views will be displayed by means of lantern slides. It is expected that papers will be contributed by leading authorities on the various aspects of town planning, and that there will be a large number of visitors from this continent. Membership of the conference will be open to architects and all others—including ladies—interested in town planning.

Read and Ponder

No other Hoist in Canada has so many practical improvements as the M & H Hoist for 1910



Let us tell you about them

No other Hoist will lift its load more easily or safely

No other Hoist has a stronger or broader guarantee behind it.

It is made in Canada and Guaranteed in Canada by

Marsh & Henthorn, Limited

Makers of Hoisting Machinery **Belleville, Ont.**

Sales Agents: MUSSENS LIMITED, Montreal

"The durability of a building is the guage of its value from an economic standpoint."

—The Philosopher of Metal Town.

Absolute perfection in workmanship and quality of material used is the reason for the superiority of our

Corrugated Sheets

Only the best quality OLD ROLLED steel is used—a much tougher and finer material than the hot rolled article.

Each sheet is accurately squared and the corrugations PRESSED one at a time—not rolled—giving an exact fit without waste.

Specify our corrugated sheets and know that you are getting the best—the strongest and most durable on the market.

Flat or curved—galvanized or painted. Any size or guage

Our special prices on car lots will interest you. Send for our new catalogue No. 70—it contains interesting information on Metallic Building Materials.

Manufacturers

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The Metallic Roofing Co Limited

TORONTO & WINNIPEG

Blonde Lumber & Mfg. Co.

Limited

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WE ARE EXTENSIVE MANUFACTURERS OF

Fine Interior and Exterior Woodwork

including Bar, Office, Bank and Church Fixtures, Mantles, Grills, etc. :: ::

Among our lines are high class Hardwood Flooring, Sashes, Doors, etc. Be sure to get our prices on these goods. :: ::

We make everything in Church Furniture.

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MANUFACTURERS OF

Staved Columns

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Newel Posts

Sashes

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Turned Newel Posts and Balusters

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Write for our Catalogue

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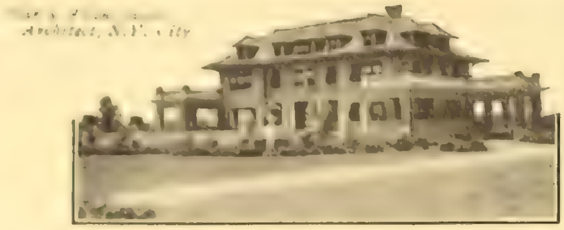
West Toronto, Ont.



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The Original and Standard Exterior Stains for shingles, siding and other outside woodwork. They are the only genuine Creosote, wood preserving stains, and the colors are rich, beautiful and guaranteed durable.

Samples and prices free from manufacturer or agents.

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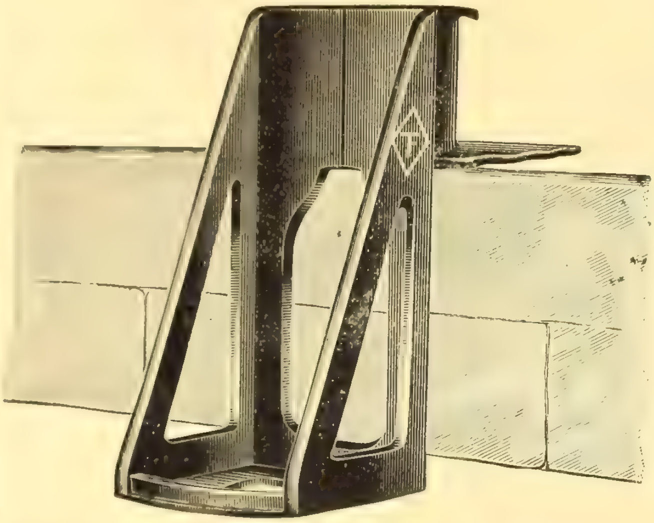
ALL SIZES AND STYLES



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Established 1855 TORONTO

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and

Steel Structures

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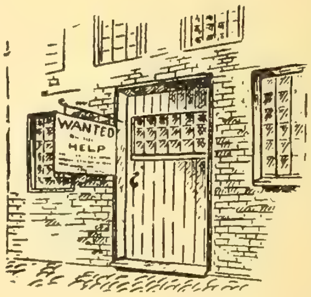

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The way to fill a vacant position was to hang out a sign on the Street

The 20th Century Way

is to advertise in the condensed columns of the **Contract Record** where you will get plenty of results.

When you have a vacancy or need a position as draughtsman, clerk of works, building superintendent or in any other, contracting, engineering, municipal or architectural capacity, let us print your want and prove to you the power of this paper.

Contract Record

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A Great Favorite

The man who knows a good thing when he sees, and who wants a good thing when he hears of it, is the man who will insist upon having

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Architects and contractors who cater to this class of men will be acting directly in the own interests by specifying this brand

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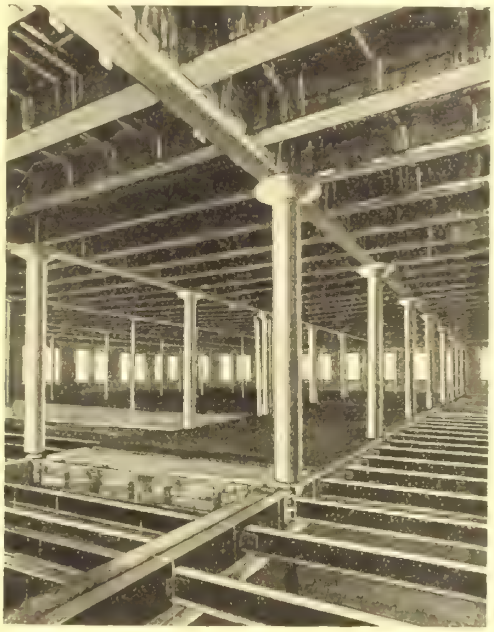

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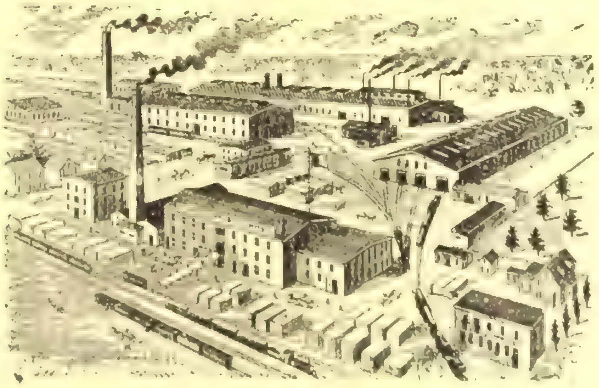

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WE BUILD

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of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

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Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

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Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc. has always given the greatest satisfaction.
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Established 40 Years

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Capacity 25,000 Tons per annum

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Producing Engineers
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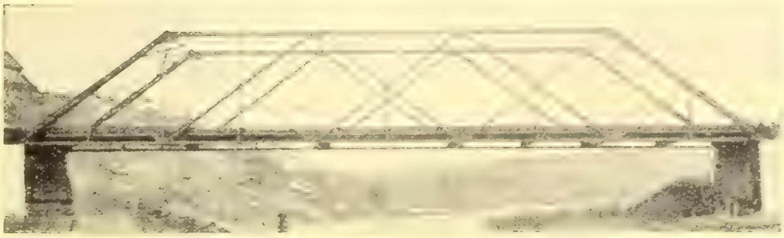

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John B. Smith & Sons
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Interior Woodwork of Superior Quality
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Established 1851

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Suitable for Sprinkler Systems
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Steel Substructures of all kinds
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Renfrew Lime

Saves the Contractor 75c. per day on each bricklayer

Bricklayers say they can lay 200 more bricks a day with mortar made from Renfrew Lime.

How is this? This is how!

The mortar sets slower, and allows bricklayer to spread for more bricks. Less time tempering mortar on board. Bricks easier bedded down. It takes more sand. It sets very hard. It costs no more than other limes. Write or wire for prices.

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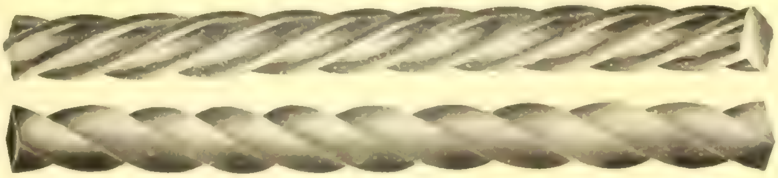
White Lime, Stone, Grey Lime, Brick, Drain Tile.

Steel Bars for Reinforcing Concrete

Plain Round, Square Flat, Twisted and Spiral Bars. Channels for Fireproofing

Squares and
Rounds
3-8 in. to
1 1-4 in.

Elastic Limit
50,000 lbs.
or Higher



HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate
Shipment
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Cut to
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Lengths

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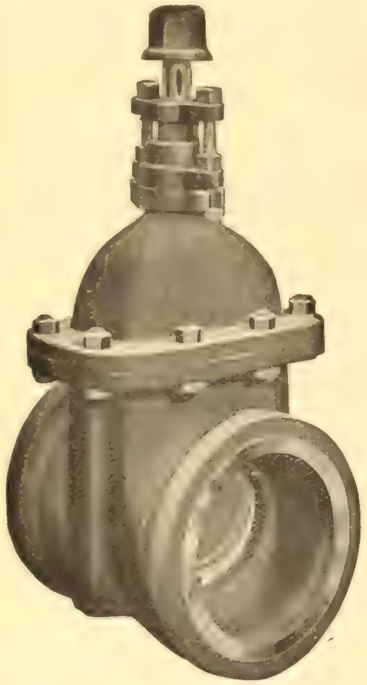
We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.



Valves
Valve
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Hydrants

We make a specialty of supplying cities and towns with waterworks equipment.

Our products are all accurately manufactured of the best brass and iron.

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The Metal Locker is now regarded as a necessary feature in every modern business establishment and public institution.

"DL" Standard Locker

is superior in design, construction and finish to lockers of ordinary make.

The many labor saving devices which we introduced in the manufacture of "DL" Lockers have enabled us to keep the cost down to a very reasonable figure. Would you like to know more about them? Then send for booklet.

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Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

CAST IRON PIPE

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

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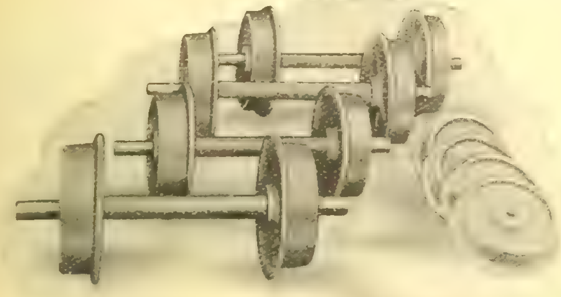

The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation

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Montreal, Que.
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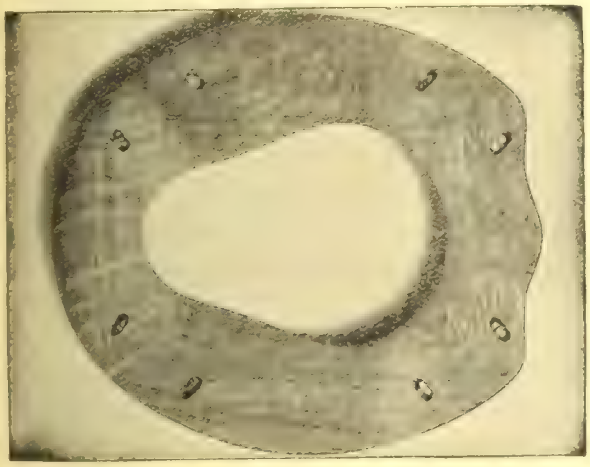
"Never Split" Seats

meet the demand for a closet seat that should always maintain its solidity, that should never under any circumstances come apart or split at the joints and that should possess sanitary perfection.

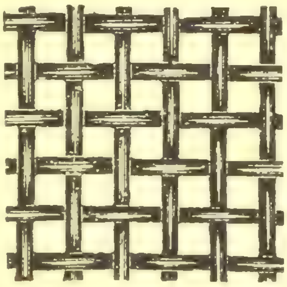


The Never Split is made in four sections, tongued, grooved and glued and rendered absolutely rigid by the addition of four steel bolts at the joint. We are manufacturers of everything in Sanitary Woodwork in all different woods and finishes. A catalog upon request.

Goderich Organ Co., Limited Goderich Canada

Canada Wire Goods Mfg. Co.

Hamilton



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Double Crimped Wire Cloth and Wire Screening

for all purposes of Steel, Iron, Brass, Copper, Bronze, Galvanized and Tinned Wire, etc.

There is no kind of Wire Fabric required in the production of any machine or manufactured article that we cannot furnish.

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Jail and Prison Metal Construction, Wire Lockers, Riddles, Laboratory Testing Sieves and General Wire Work of every description.

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Inquiries solicited

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Studebaker Sprinklers manufactured by us do not clog or get out of order. Greatest width of spray. Can be graded from driver's seat to any volume.

Get our prices on street sweeping machines.

Geo. Heaman, London, Ontario

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High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

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Hardens with Age. Low Price. Samples and Quotations Free

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For Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U.S. Letters Patent.

Toronto Canada

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We have the following for prompt shipment:
Building and Crushed Stone, Lime, Cement, Fire Clay, Plaster, Fire Brick, Hair, Sewer Pipe, Weeping Tile

Advise us of your requirements

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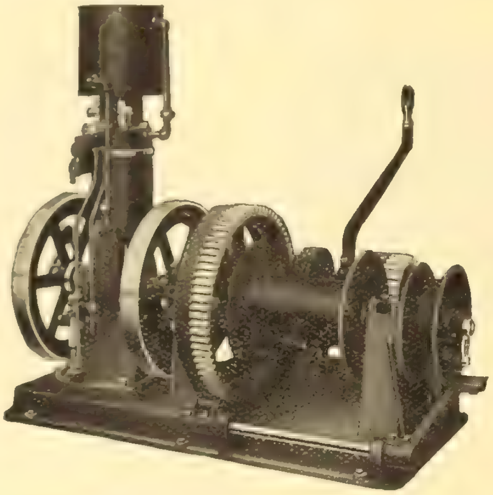
Climax Gasoline Hoisting Engine

Can be operated either by Steam, Gasoline or Electric Power



TESTIMONIAL Orillia, October 19, 1909.

To Whom it may concern;

This is to certify that we purchased a Climax Hoisting Machine with four horse power gasoline engine attached also one complete "Climax Material Elevator" with two platforms, same has been installed in our contract, the Tudhope new factory. We find that this hoist will take up material fast enough to keep thirty bricklayers supplied with material. The machine has so far proven most satisfactory.

Yours truly,

(Sgd.) Ed. E. Webb.

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Our factory is the Most Complete and Modern in Canada for the manufacture of

Fine Hardwood Interior Finish

We are furnishing the Interior Trim for a large percentage of the best Residences, Banks, Churches and other Public Buildings in the country. We also contract for all Carpentry Work. We maintain a high standard of workmanship and material. By specifying our high-grade Fittings, Architects and Contractors are sure of completing the work with satisfaction to themselves and the owner. A million feet of Thoroughly Seasoned Hardwoods always in stock.

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There is a Reason:

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LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plant.

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Construction Co.

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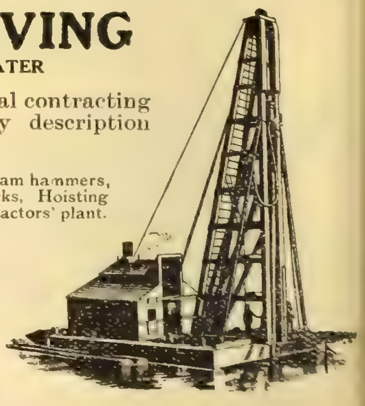
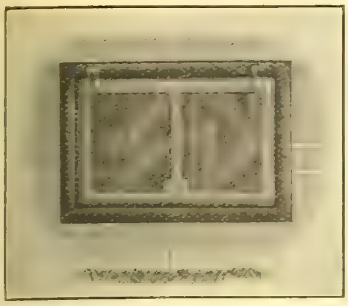




The "MODEL" with rubber glass.

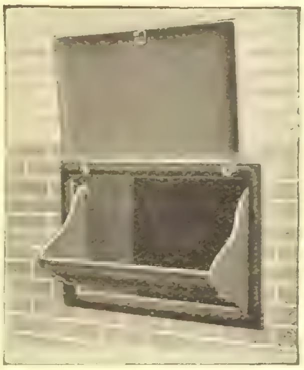
MODEL COAL CHUTE

These cuts show the Coal Chute both open and closed. This is the new way to equip a house so as to do away with the annoyance of broken windows and disfigured window frames.

The door when open protects the wall above the chute, and when closed locks automatically, and is positively burglar proof.

The "MODEL" is supplied with rubber glass so that light can be admitted to the basement.

Made in three sizes. **Send for our descriptive booklet.**



THE DOWN DRAFT FURNACE COMPANY, Limited
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Maple Flooring

WE have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end matched,** and **bundled.**

Write Us for Quotations

Woodstock Lumber & Mfg. Co.
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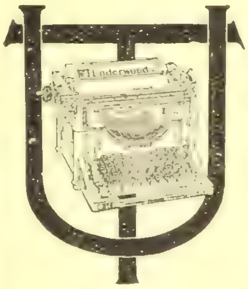

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Hard Laurentian

Birch Flooring

Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
Bored and Bundled.

Manufactured by

The Standard Mills, Limited
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Write for particulars and samples.

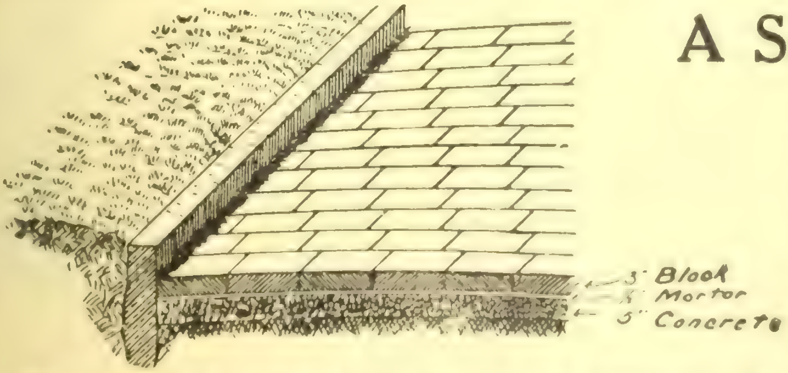
Greening's WIRE ROPE

The Greening Catalog No. 1. contains some very valuable information about the use and care of Wire Rope. Write for a copy.

We make all kinds and sizes of Wire Ropes for every conceivable purpose. Our plant is the oldest and best equipped in Canada. We carry large stocks of all standard grades and sizes and can ship on receipt of order.

Our prices are the closest.

The B. Greening Wire Co.
Hamilton, Ont. Limited Montreal, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

Asphalt Block Pavements

Send for Descriptive Literature

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GALT - ONTARIO
Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto.—

	Per M.
No. 1 dry pressed red bricks..........	$18.00
No. 1 dry pressed buff bricks..........	18.00
Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, or foundation work.....	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D,D.
10 to 25 united inches......	$4.25	$ 6,25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.......	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.......	4.25	3.75	7,25	5.50
50 u. i.......	4.75	4.25	8.75	6.50
60 u. i,......	5.00	4.75	10.00	7.50
70 u. i.......	5.25	5.25	11.50	8.50
80 u. i.......	5.75	6.00	12.50	9.50
85 u. i.......	....	....	14,00	10.50
90 u. i.......	....	....	16.50	11.50
95 u. i.......	.,..	....	18.00	13.50
100 u. i.......	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

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(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex. and 3-16-inch round, 35 cents per square foot up.
Floor Tile—½-inch square 45 cents.
Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 25 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish colors, firsts 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G, Cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

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Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock.........net	$1.65
No. 4½ Fuller's ....net	2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Furnaces 45 per cent.; registers 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.; other specials, 40 per cent.

Boilers—Galvanized Iron Range,

30-gallon, standard, $4.75; extra heavy, $7.00.

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Lead pipe, 25 per cent. off; lead waste, .25 per cent. off; caulking lead, 4¾ cents per pound; traps and bends, 50 per cent.

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¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

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Light pipe 60 and 10 per cent.; fittings, 70, 50 and 10 per cent.

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Pure Linseed Oil Putty, bulk, in barrels, $3.00 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

The B. C. Gazette gives notice of the incorporation of the following companies: C. E. King Company Limited, incorporated to carry on a general contracting business, capital $10,000; Cariboo Motor Company Limited, capital $25,000; Mather, Yuill & Company, Limited, incorporated to carry on a general engineering and construction business, capital [illegible]; John R. Bowes Timber Company, Limited, capital, $10,000; the Howe Sound Timber Company, Limited, capital $50,000; the Kinsella [illegible] Trolley Head and Wheel Company, Limited capital $10,000; Trout Lake Lumber Company, Limited, capital [illegible]; Fort George Supply Company, Limited, incorporated to build, and construct sawmills, etc., capital $50,000; Slocan Lake Lumber Company, Limited, capital [illegible]; [illegible] Fruit & Irrigation Company, Limited, incorporated for constructing and operating electric works, capital [illegible]; the [illegible] Lumber Company, Limited, capital $30,000.

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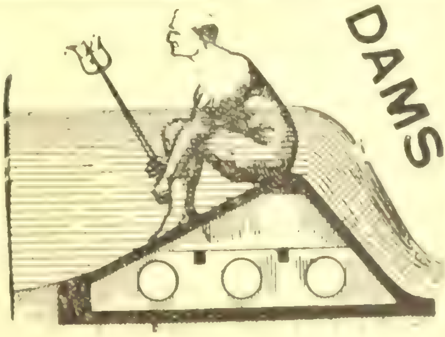

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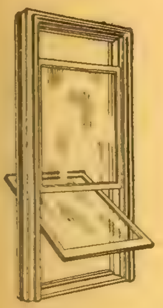

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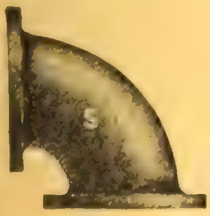

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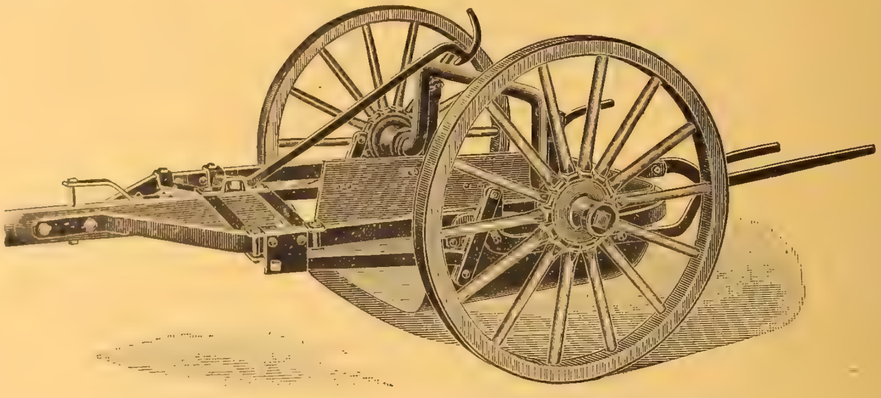

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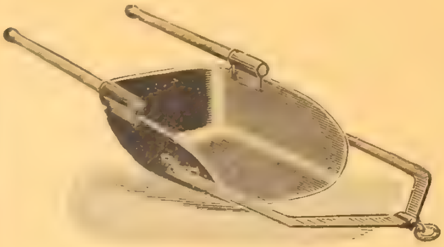

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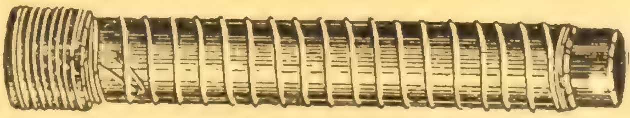

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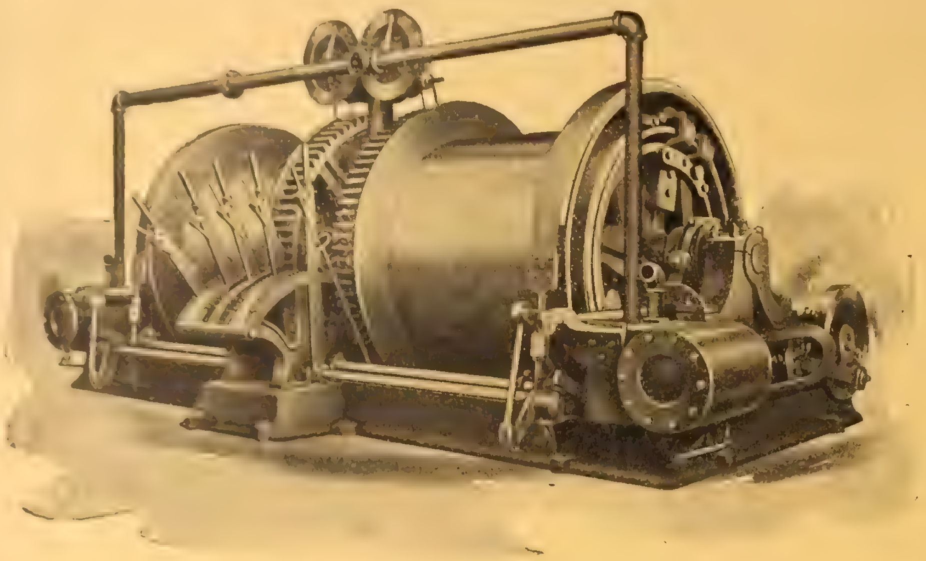

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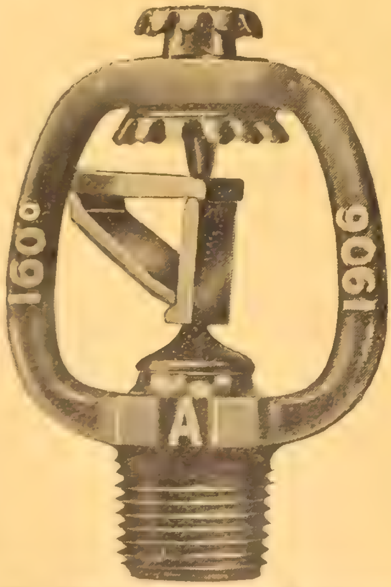

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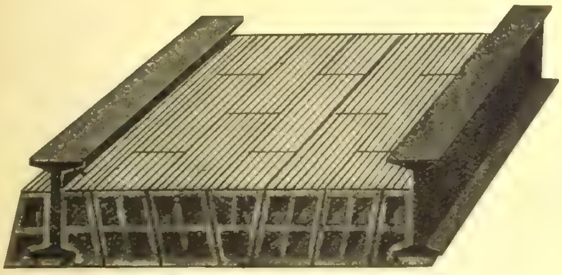
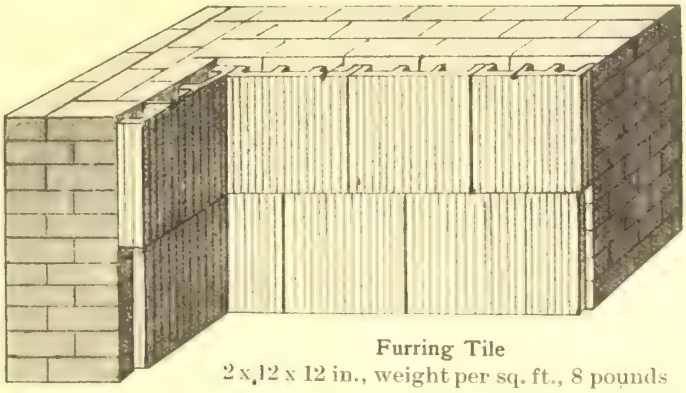


Perspective of Typical Arch



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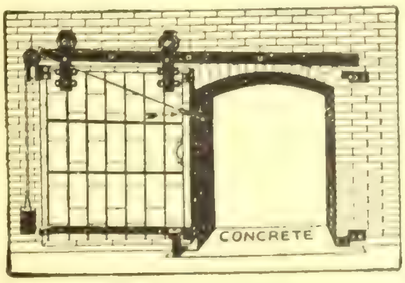

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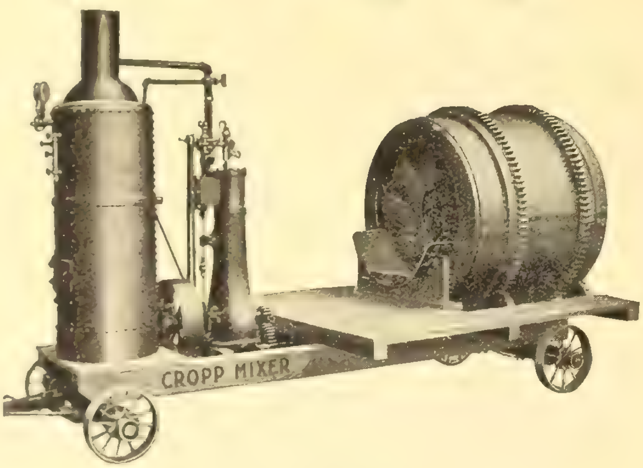
Cropp Mixer



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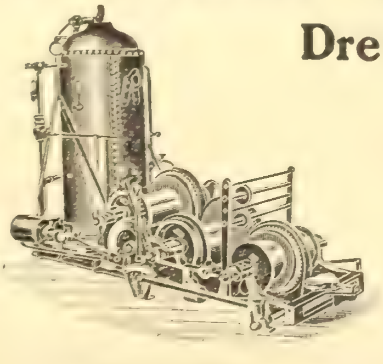

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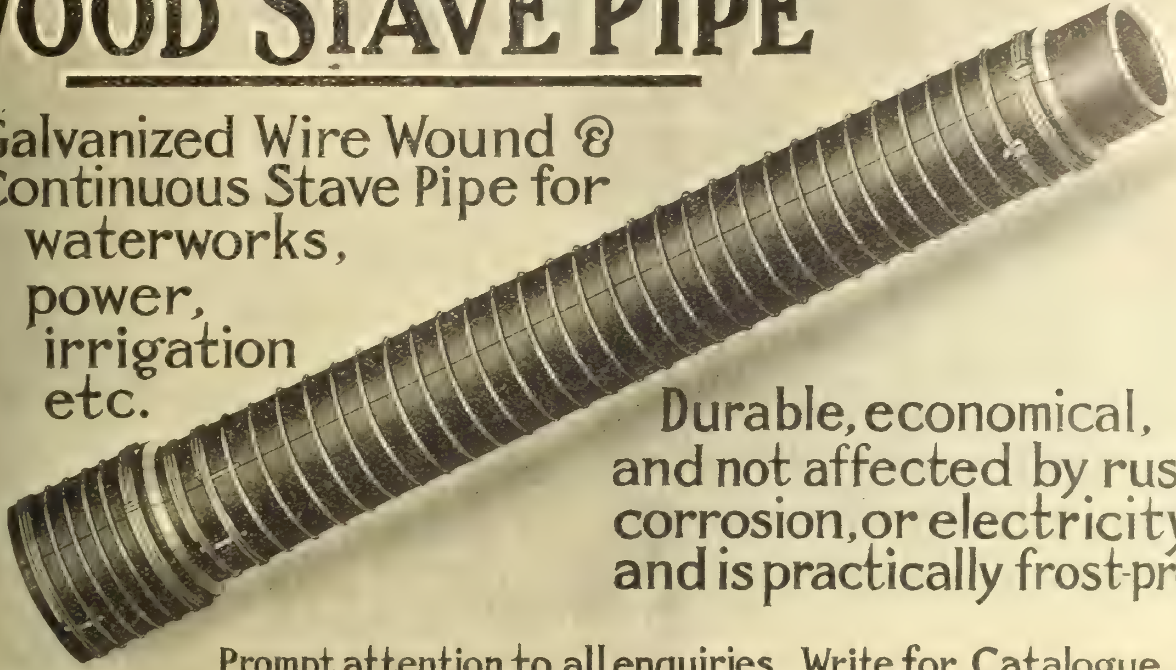

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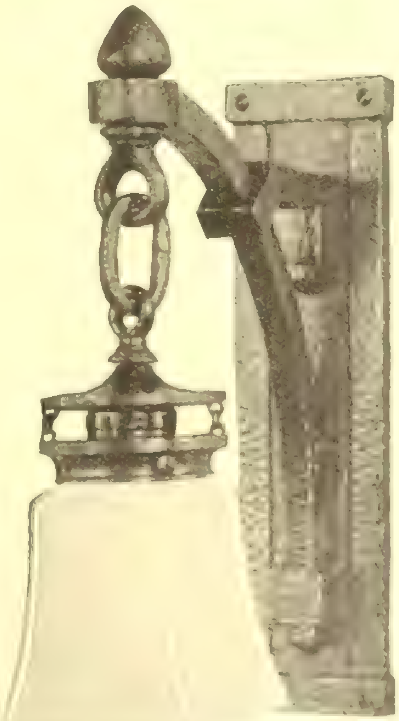

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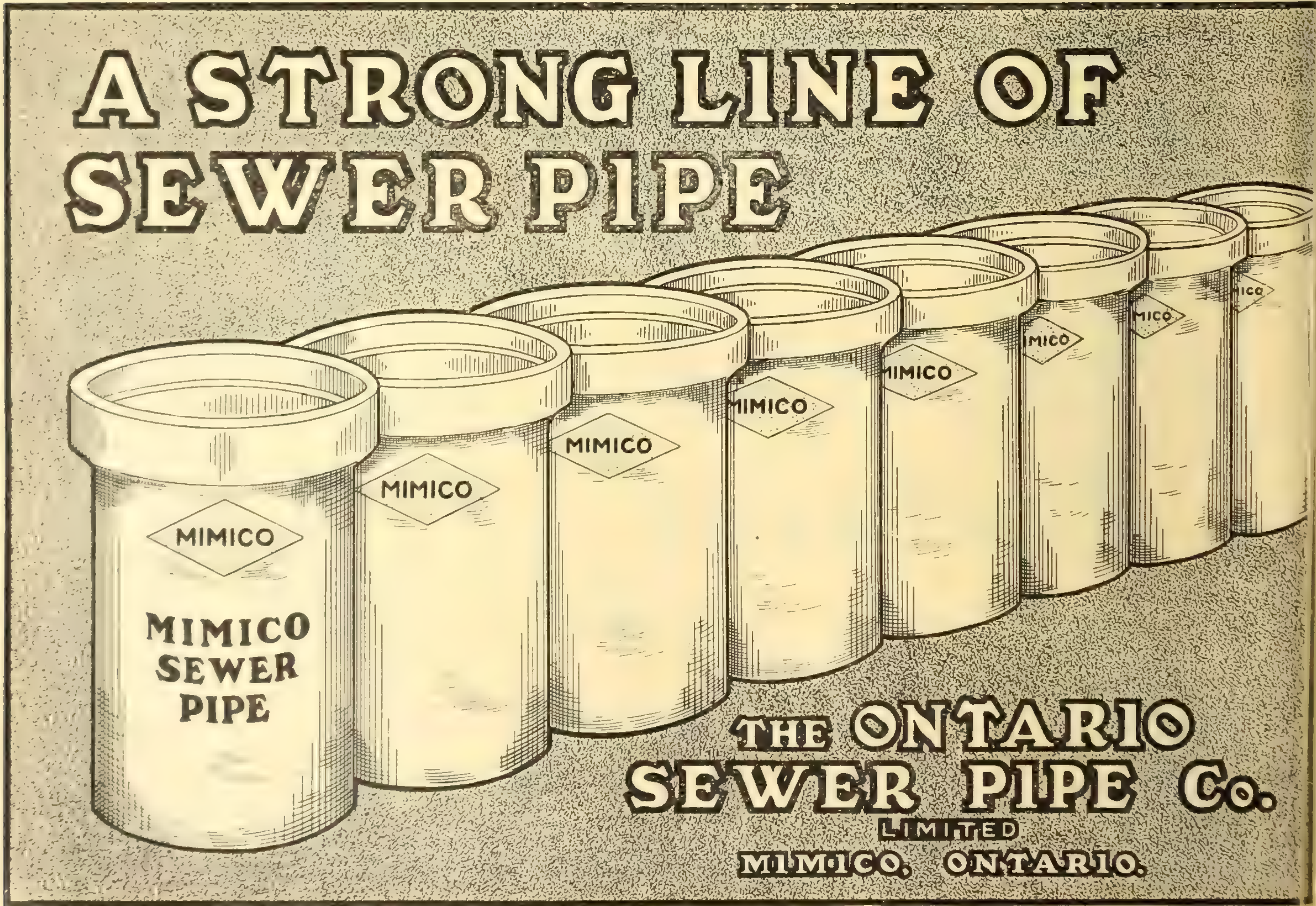

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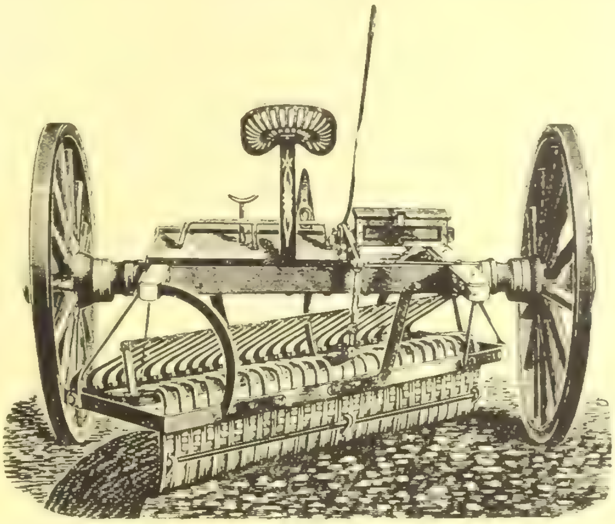

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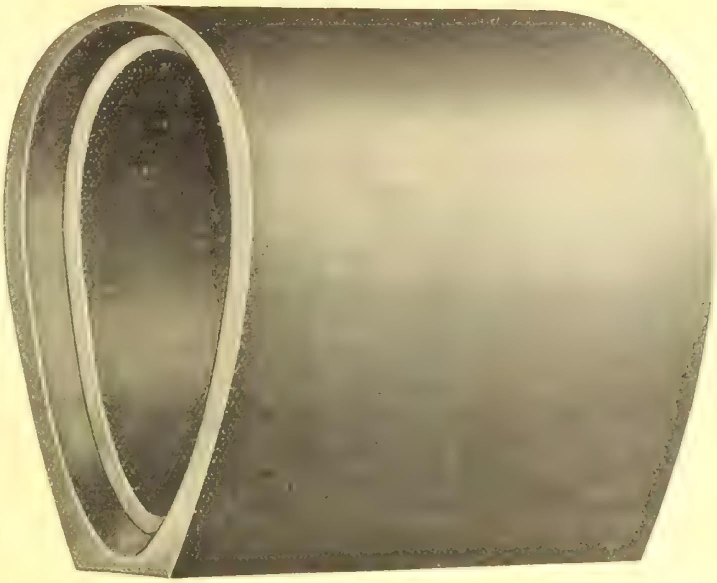
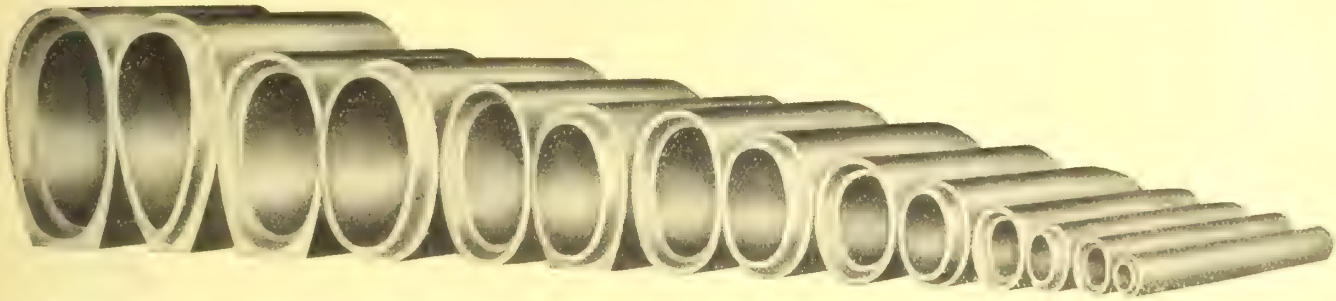
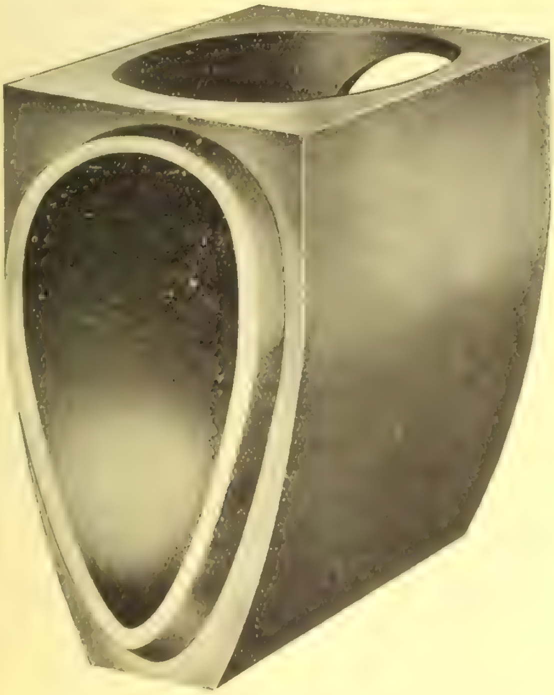


Section of 2' x 3' pipe.





Man-hole Section of 2' x 3' pipe

Concrete sewers abound in England and Germany. The modern sewers of Paris are all of concrete. American cities have adopted it. Brooklyn has hundreds of miles of it with not a single failure, whereas even Scotch vitrified pipe has been found to have deplorably failed there. Toronto, after much hesitation, is now in line with concrete. Why be the last to join the ranks you eventually will and must join?

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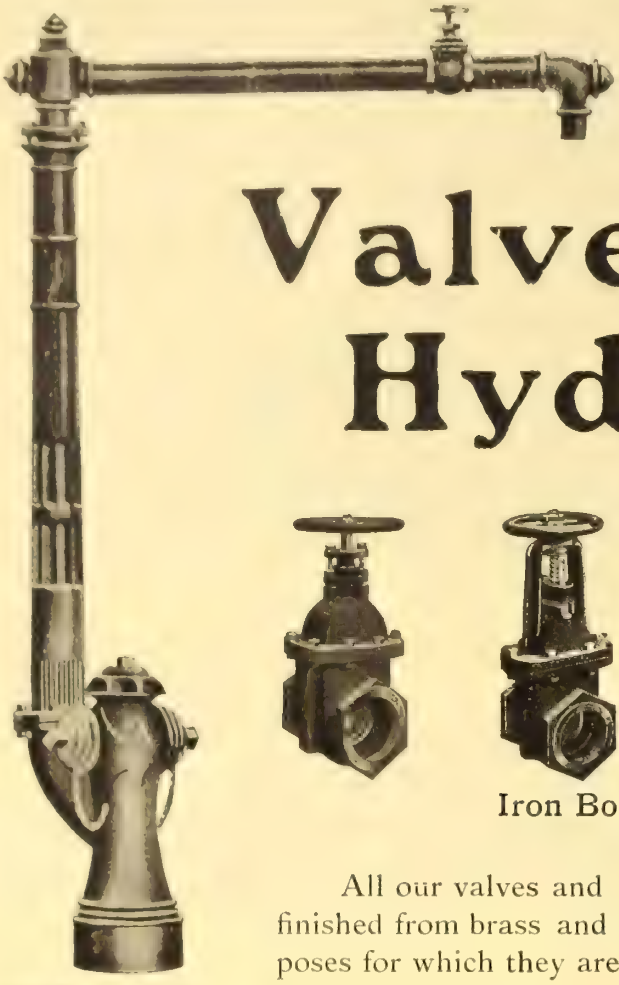

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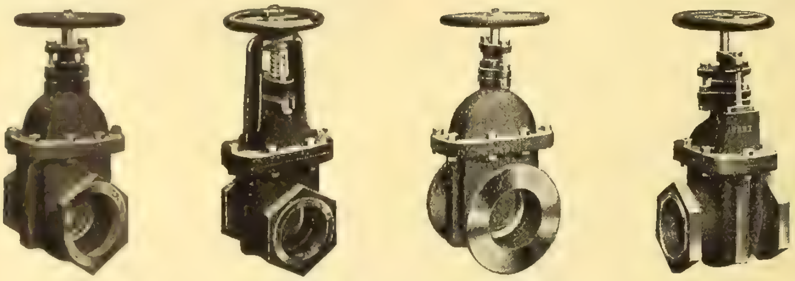

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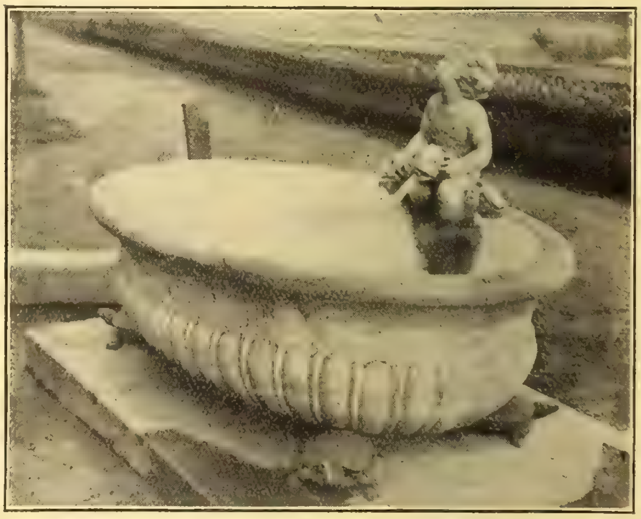

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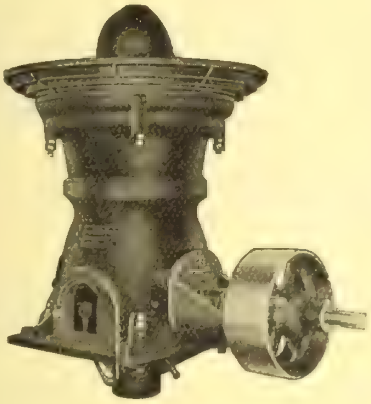

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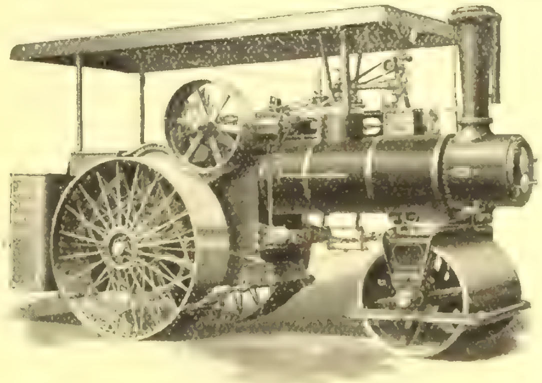

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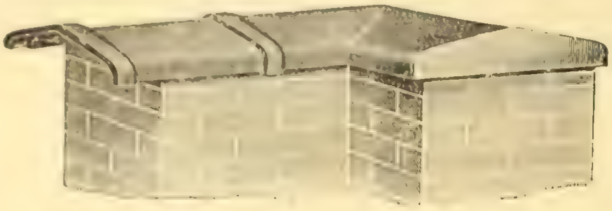

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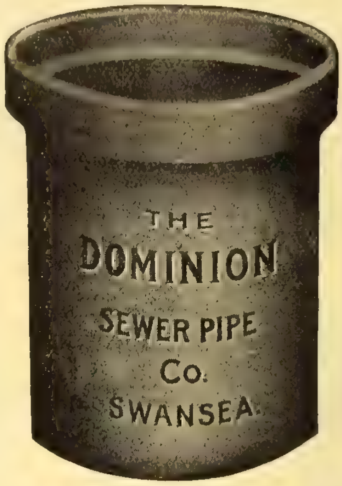

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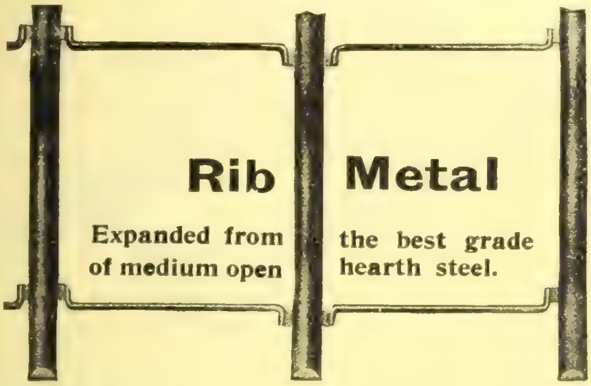

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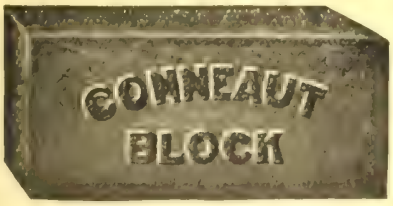

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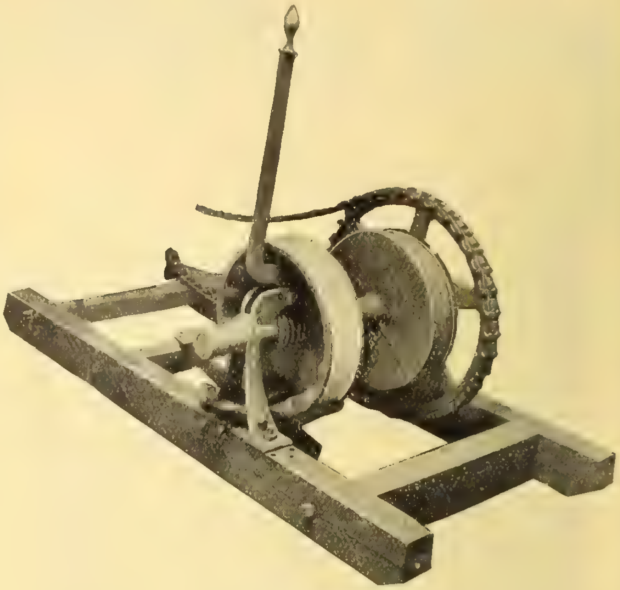

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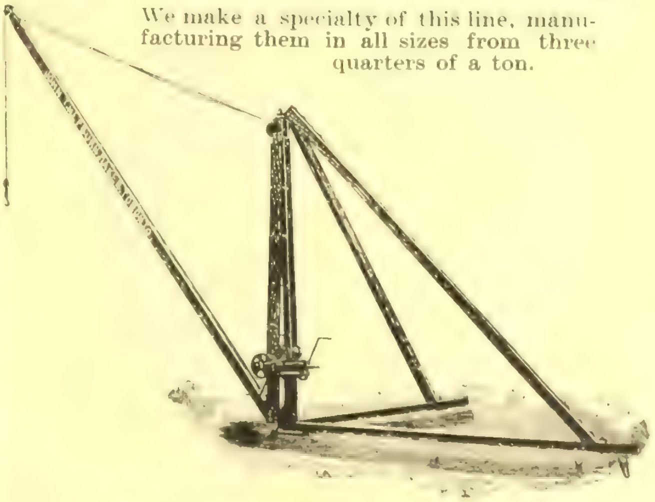

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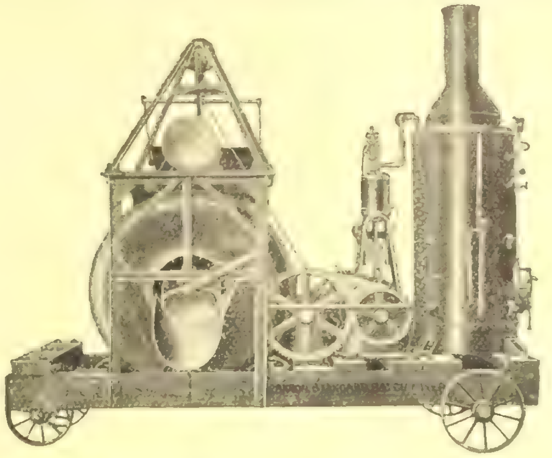

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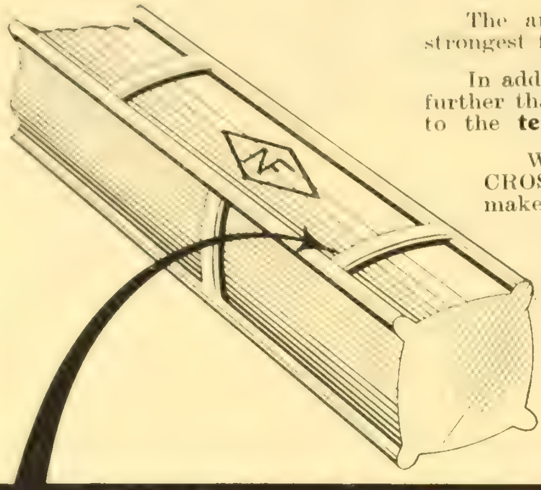

The arrow points out the **longitudinal rib** which is one of its very strongest features.

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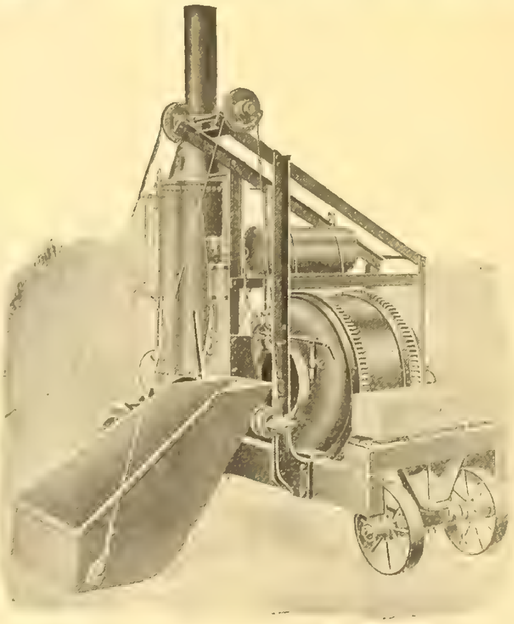

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Beith, Que.

Tenders addressed to Andrew Coffey, mayor, will be received until May 10th for the building of about 8 miles of macadamized road in the Municipality of Elgin. Specifications, etc., on application to the above mentioned.

Bridgeburg, Ont.

It is stated that contract will be let the latter part of this month for sewer system, cost $30,000. Engineer, Geo. Ross, of Welland.

Dauphin, Man.

A bylaw has been passed to issue $175,000 waterworks debentures.

Dunnville, Ont.

J. W. Holmes, clerk, sends us the following list of tenders for pumping plant for sewer system being established here: Pumping Station — Excelsior Constructing & Paving Company, Limited, Toronto, Ont., for the completion of that part of the contract consisting of a rectangular excavation 16 feet 8 inches by 20 feet and 24 feet deep, $5,385; furnishing and laying (about) 3,300 feet of 3-inch galvanized iron pipe, $1,776. Ejection Plant — Westinghouse Company, air pump, $160; reservoir, small, $100. Hill & Company, air compressor, $690. Mussen's, Limited, air compressor, $430; reservoir, large, $145. Total, [illegible].

Galt, Ont.

On May 13th a bylaw will be voted on to issue $5,000 4 1-2 per cent. waterworks debentures. Joseph McCartney.

Halifax, N.S.

Among the improvements arranged for the coming summer are water service extension on Morris street and sewer work in west end.

Haileybury, Ont.

On May 2nd the ratepayers will vote on bylaws to issue $25,000 30-year 5 per cent. waterworks debentures, and $10,000 15-year 5 per cent. street improvement debentures. Theo. H. Connor, town clerk.

Islington, Ont.

Tenders addressed to J. A. L. Macpherson, clerk, will be received until May 2nd for construction and completion of sewage disposal works for main sewerage at New Toronto. Plans, etc., at office of above or at office of the engineers, Murray & McAllister, Continental Life Building, Toronto.

Ladner, B.C.

Tenders will be received up to May [illegible] by the council for [illegible] waterworks debentures. N. A. McDiarmid, C.M.C.

Montreal Que.

Tenders will be received until May 4th for the construction of a main sewer from [illegible] and [illegible] streets, passing through the C. P. R. property and along Tenth avenue to Masson street. John R. Barlow, city surveyor.

City Surveyor Barlow's report to the Board of Control recommends an expenditure of $502,690 for the laying of permanent sidewalks.

Maisonneuve, Que.

$600,000 has been appropriated by the Council for academizing street grading, sewers, etc., and it is expected that this work will be caried out this present season.

Moose Jaw, Sask.

The following tenders have been received for concrete sidewalks: Ontario Concrete Paving Company, Toronto, $17,490; R. L. Frost, Moose Jaw, $18,656; Forest City Paving Company, Regina, $19,472; Western Pavers, Limited, Winnipeg, $20,210; Navin Bros., Moose Jaw, $20,988; Clark & Jones, Owen Sound, $23,028. For curb and gutter: Ontario Concrete Paving Company, Toronto, $6,480; Navin Bros., Moose Jaw, $8,100; R. L. Frost, Moose Jaw, $8,100; Clark & Jones, Owen Sound, $8,100; Western Pavers, Limited, Winnipeg, $8,505; Forest City Paving Company, Regina, $8,775; National Paving Company, Winnipeg, $13,500. Details of contract, 13,500 lineal feet of curb and gutter, and 116,500 square feet of sidewalk.

Following is a list of the bids received for material for and construction of 33,300 square yards of pavement: (1) Bitulithic and Contracting, Limited, Winnipeg—Bitulithic pavement, wearing surface, 2 inch to 2 3-4 inches thick, $103,152; 3 inch creosote block pavement, wearing surface, 1 1-2 inches, $94,931; 3 inch creosote block pavement, $116,472. (2) Rudolph S. Blome Company, Chicago — Granatoid pavement 1 1-2 inch wearing surface, $105,184. (3) National Paving & Contracting Company, Winnipeg — Natural Asphalt sheet pavement, wearing surface, 1 1-2 inch, $94,931. (4) Forest City Paving Company, Regina—Creosote wood block pavement, wearing surface, 3 inch, $103,230. (5) Navin Bros., Moose Jaw — 3 inch asphalt block pavement, $120,750; 2 1-2 inch block, $107,763. (6) The Kettle River Company, Minneapolis — Creosoted wood block pavement, thickness of wearing surface, 3 inch, 3 1-2 inch and 4 inch—3 inch block, 14 x treatment, $103,400; 3 inch blocks, 16 x treatment, $106,064; 3 1-2 inch blocks, 14 x treatment, $111,725; 3 1-2 inch blocks, 16 x treatment, $114,389; 4 inch blocks, 16 x treatment, $124,379. 7) Fielding & Shepley, St. Paul—Creosoted wood block pavement, 3 1-2 wearing surface, $117,070. (8) McKay Construction Company, Regina—Westrumite pavement, 2 inch wearing surface, $89,244.

Nanaimo, B.C.

The bylaw to raise [illegible] for the purpose of constructing a concrete dam at No. 1 reservoir was carried.

Ottawa, Ont.

Tenders addressed to the chairman of Board of Control will be received until April [illegible] for asphalt pavement on Wellington street from [illegible] limit of Queen street to west limit of Broad street. Specifications on application to City Engineer Ker.

An agreement has been reached (but not officially ratified) between Ottawa and Aylmer for the installation of septic tanks in the latter town, for the purification of its raw sewage. Cost of tank, $5,000. Mayor Hopewell and City Engineer Ker represented Ottawa; Mayor Wright and Mr. T. P. Foran, Aylmer.

Paisley, Ont.

Tenders addressed to J. C. McIntyre, town clerk, of Elderslie, will be received until May 2nd for the manufacture and delivery of cement culvert pipes of different sizes.

Prince Rupert, B.C.

Messrs. Lynch, McKay and Douglas, the citizens' committee have been authorized to go on with the $4,000 sewer extension on Sixth avenue and the $13,000 waterworks extension in sections 1, 6 and 7. H. H. Douglas, secretary; A. W. Agnew, engineer.

Quebec, Que.

T. Gallagher, water works engineer, is calling for tenders until May 10th for 250 tons of cast iron pipe.

Stratford Ont.

Tenders for pavements were as follows: Armoured concrete, $1.41 per square yard, Todd & Company; tralithic, $1.56 per square yard, J. Conn; granite block, $3.90 per square yard, Hassan Paving Company; compressed concrete, $1.79 per square yard, Hassan Paving Company; Apposite, $1.77 per square yard, Hassan Paving Company; concrete macadam, $1.25 per square yard, Fielder & Company; asphalt block, 3 inch block, $2.56 per square yard, Fielder & Company; asphalt block, 2 1-2 inch block, $2.29 per square yard, Fielder & Company; asphalt block, 3 inch block, $2.58 per square yard, R. Bangham; asphalt block, 2 1-2 inch block, $2.30 per square yard, R. Bangham; vitrified brick, $2.59 per square yard, Fielder & Company; vitrified brick, $2.30 per square yard, Crowley & McDonnell; vitrified brick, $2.37 per square yard, Gibb Construction Company; vitrified brick (cement filler), $2.22 per square yard, Gibb Construction Company; Westrumite, $1.97 per square yard, Westrumite Company; bitulithic, $2.25 per square yard, Warren Bituminous Company; creosote block, 3 inch., $2.32 per square yard, Hyde, jr.; creosote block, 4 inch., $2.47 per square yard, Hyde, jr. These prices as based on Nat Elger's tender for excavation, 34 cents, and Secord & Sons' tender for concrete base, 51 cents. For concrete curbs and gutters— concrete curbing, 18 inch, Crowley, 37 1-2 cents; Fielder, 60 cents; L. Malcolm, 38 cents; Conn, 41 cents; Todd & Company, 33 cents; Gibb 32 cents. Concrete gutter, 16 inches wide—Crowley, 19 cents; Fielder, 23 cents; L. Malcolm, 15 cents; Conn, 24 cents; Gibb, 17 cents. Concrete gutter, 14 inches wide—Crowley, 17 cents; Fielder, 21 cents; L. Malcolm, 13 cents; Conn, 22 cents; Gibb, 15 cents. Combined 6 inch curb and 14 inch gutter Crowley, 38 cents; Fielder, 43 cents; L. Malcolm, [illegible] 35 cents.

St. Boniface, Man.

This municipality has an extensive programme of local improvements consisting [illegible] pavement and sidewalks. The principal item of interest is trunk sewer from southeast corner of Exhibition grounds to the river, estimated cost, $128,[illegible].

Toronto, Ont.

City Engineer Rust has been instructed to call for tenders for supply and laying of 2,000 feet of pipe. Extension of intake pipe estimated at $78,000.

The proposed plans for the sewage outfall works at New Toronto have been approved by the Provincial Board of Health, and call for an expenditure of about $20,000. Plans for certain sewers at Thorold were not approved, there being no provision for the treatment of the sewage. The sewage purification plans for Wingham and those for waterworks for Latchford were approved. Plans for the west end sewage disposal for Ottawa were also approved.

Vancouver, B.C.

Tenders addressed to W. McQueen, city clerk, will be received until May 3rd for construction of wood block pavement on Robson street. Plans, etc., at office of City Engineer, City Hall.

Westmount, Que.

Tenders addressed to A. D. Shibley, City Clerk, will be received until April 30th for supply of crushed limestone and granite; sand and gravel; vitrified sewer pipes and farm tile; cement; sewer brick, granite setts, scoria and other paving blocks; tar and pitch for paving purposes; lumber, required by the Road Department for year commencing May 1st. Specifications at office of City Engineer.

Winnipeg, Man

Tenders for excavation of about 8,000 yards of trenching on city streets will be received until April 30th. Plans at 705 Builders' Exchange.

AWARDED.

Campbellton, N.B.

The Council let contracts for the ensuing year as follows: Bar lead, lead pipe, wrought iron pipe and fittings, and brass goods, Jas. Roberston Company, Limited, St. John, N.B.; excavations for water service, Wm. J. Christie, Campbellton, N.B.

Guelph, Ont.

Contract for laying cement macadam foundations for pavements has been awarded to Fielder Paving Company, of Chatham.

Moose Jaw, Sask.

H. G. McVean has been awarded the contract for laying 7,000 lineal feet of sewer pipe, including manholes, catch basins, etc. P. Kilkenny bid at $9,522.

Montreal West, Que.

The contract for the construction of roadways and sidewalks to the extent of $30,000 has been awarded to R. T. Smith & Company, Westmount.

Saskatoon, Sask.

J. H. Trusdale, city clerk, writes that the contracts for excavating and pipe laying have been awarded as follows: Sections 1, 2 and 4 were awarded to the Saskatoon Construction & Engineering Company, $64,485; section 3 to william Cooke, contractor, Saskatoon, $27,330.

The following list of tenders for labor in connection with the new sewage disposal and waterworks has been received for sections 1, 2, 3 and 4, and bulk, respectively: William Cooke, $14,874, $29,875, $27,330, $22,639, $94,700; Saskatoon Construction Company, $14,052, $28,825, $29,823, $91,437; John Craig, $20,889, $36,391, $35,825, $24,712, $112,385; William Newman Company, Limited, $23,300, $43,800, $30,400, $33,300, $135,600; James Priel, section 1, $15,340. The tender of the Saskatoon Constructing Company was accepted for sections 1, 2, and 4, while for the 3rd section the contract went to Wm. Cooke. Other tenders: For the coal and oil warehouse, V. Simmons, $3,335; G. N. Hughes, $2,168; Jas. Allan, $2,247; deferred. Standpipe base, Saskatoon Construction & Engineering Company, $2,677, accepted.

Toronto, Ont.

Contracts have been awarded by Board of Control for pipe required for 1910, as follows: The National Iron Works, 3-inch iron pipe at $4.35 per length; 4-inch at $4.88; 6-inch at $6.97. The Canada Foundry, 8-inch iron pipe at $10.50; 10-inch at 14.80; 12-inch at $19.85.

Ryan & Reilly, Philadelphia, were awarded the contract for the construction of the siphon under the Don in connection with the high level intercepting sewer. A local firm, Miller, Cummings & Robertson, tendered at 44,900.

Contracts for balance of construction of high level intercepting sewer (not including siphons) have been awarded as follows: Logan avenue to Leslie street, 3,409 feet in length, sewers 9 feet and 9 feet 3 inches, John Wagner, Cleveland, Ohio, $31.52 per foot; Don to Logan avenue, 2,093 feet in length, sewer 8 feet 9 inches, J. H. McKnight Construction Company, this city, $30.85; Leslie street to Morley avenue, 3,246 feet in length, sewer 9 feet 6 inches, W. J. Gawne, Cleveland, $23.70;; Morley avenue to disposal tanks, 1,216 feet in length, sewer 7 feet 10 inches, Wm. Layman, Nicholson & John, Cleveland, $19.35.

The following contracts for pavements have been awarded: (1) Asphalt Pavements — Austin avenue, Pape to Marjory, Barber Asphalt Company, $2,033; Castle avenue, Spadina to Kendal, City Engineer, $1,723; Chesley avenue, Brock to east end, City Engineer, $1,076; Claremont street, Queen to Arthur, Construction and Paving Company, $9,841; Marlborough avenue, Avenue road to Sidney street, City Engineer, $1,778; Nassau street, Bathurst to Lippincott, Constructing and Paving Company, $1,190; Oak street, Parliament to River, Barber Asphalt Company, $9,326; Salem avenue, Fernbank to Hallam, City Engineer, $1,709; St. Clarens avenue, College to Bloor, Godson Contracting Company, $11,650; Woodlawn avenue, Woodlawn to Fairham, Godson Company, $1,798. (2) Vitrified Block Pavements—Renfrew Place, McCaul to east end, Forcott Contracting Company, $667; Greenwoods ave., Queen to G. T. R., Godson Contracting Co., $76,775. (3) Bitulithic Pavements—City Engineer gets Russell Hill road, St. Clair to Heath, $4,937; Macpherson avenue, Yonge to 1,330 feet west, $6,392; Concord avenue, College to Dewson, $5,188; Warren Bituminous Paving Company, Gorevale avenue, Queen to Arthur, $11,000. (4) Asphalt Blocks—College street, Manning to Dovercourt, Barber Asphalt Company, $43,914.

The following contracts for pavements have been awarded per foot: Sidewalks, concrete—Austin avenue, both sides, Pape avenue to Marjory avenue, Gardner Contracting Company, 59 cts.; Amelia street and Hillcrest Place, Sumach street to 582 feet east, E. Reeve, 64 cts.; Barrett avenue, both sides, Conduit street to Chelsea avenue, Excelsior Paving & Contracting Company, $1.10; College street, north side, Palmerston to Manning, A. J. Pemberthy, $1.00; Follis avenue, north side, Manning to Clinton, City Engineer, 70 cts.; Frederick street, east side, King to Front, City Engineer, 78 cts.; High Park Garden, both sides, Howard Park avenue to Indian road; Grant Contracting Company, 90 cts.; High Park avenue, west side, Humberside to Conduit, Forcott Contracting Company, 65 cts.; Hilcrest avenue, east side, Amelia to 133 feet north, E. Reeves, 77 cts.; Hillcrest Park, north and west sides, E. Reeves, 39 cts.; Huron street, west side, College to lane south, Forcott Contracting Company, 65 cts.; Jameson avenue, west side, King to Queen, Grant Contracting Company, 65 cts.; John street, east side, Queen to Grang cts.; John street, east side, Queen to Grange avenue, E. Reeves, 62 cts.; King street, north side, Dufferin to Dunn, Grant Contracting Company, 75 cts.; Logan avenue, east side, First to Gerrard, City Engineer, 70 cts.; Laburnam avenue, west side, Jameson to Dowling, Thompson Contracting Company, 68 cts.; Lovatt Place, north side, Sumach to east end, E. Reeve, 50 cts.; Markham Place, south side, Markham to west end, City Engineer, $1.00; Margueretta street, west side, Dundas to College, Grant Contracting Company, 66 cts.; Ontario street, east side, Winchester to Wellesley, Gardner Construction Company, 65 cts.; Queen street, north side, John street to St. Patrick Square, Gardner Company, 17 1-2 cts; Princess street, west side, King to Front, City Engineer, 78 cts.; Russell Hill road, both sides, St. Clair to Heath, City Engineer, 75 cts.; Sumach street, both sides, King to Queen, E. Reeve, 62 cts.; Shanley avenue, north side, Dovercourt to Westmoreland, Forcott Contracting Company, 67 1-2 cts.; Wright avenue, north side, Sunnyside to Keele, Grant Contracting Company, $1.02; Walker avenue, south side, 769 feet west of Yonge to 492 feet west, City Engineer, 56 cts.

Vancouver, B.C.

Contractor Ledingham was given a contract to construct 15 miles of concrete sidewalk at 13 cents per foot. Other tenders were: Palmer Bros. & Henning, 13 1-3 cents; McEachern & Richardson, 13 1-2 cents.

Wetaskiwin, Alta.

John Hawke was given the contract for back-filling on sewer work here at 4 3-4 cents a foot.

Winnipeg, Man.

The Canadian Fairbanks Company, this city, has been awarded the contract for supply of hydrants to be installed this year at $37 each. T. H. McAvity, of St. John, N.B., that for valves.

The following tenders for sewers and block pavements were awarded by the Board of Control: Sewer on Rosedale avenue, $1,506.70; sewer on Meade street, $171.70; awarded to the city engineer of construction. Thomas Jackson & Son received the contracts for the following three stretches of block paving: Livinia avenue, $2,380.18; Ellice avenue, $2,377.14; Lent avenue, $4,164.

The following contracts have been awarded. Sewer—Harbison avenue, Thomas Jackson & Son, $4,387.90. Water main—Harbison avenue, engineer of construction, $849.27. Water main—Tweed avenue, engineer of construction, $6,745. Sewer—Tweed avenue, from Stadacona to Roland street, Thomas Jackson, $2,852.40. Granolithic sidewalk, south side of Assiniboine, from west line of lot 244 to east line lot 247, engineer of construction, $221.10. The following works were placed on the order form for immediate construction: Sewers, Jessie avenue, from Amelia to Guelph street, $5,100; McMillan avenue, from Aynsley to Lilac street, $1.425. Water main, McMillan avenue, from Aynsley to Lilac street, $750.

Woodstock, N.B.

Contract for sidewalk was awarded to the Silica Barytic Stone Company, 8 3-4 cents for walks, 12 1-2 cents for crossings.

Railroads, Bridges and Wharves

Chatham, N.B.

Tenders are being called until May 10th for railway from Nelson to this place. See advertisement in this issue.

Guelph, Ont.

Tenders are being called by W. Panton, county clerk, Milton, Ont., for construction of reinforced concrete arch, etc. Barber & Young, consulting engineers. See advertisement in this issue.

Kingston, Ont.

Kingston & Pembroke Railway will carry out a number of improvements on the line this summer, the total cost of which will amount to over $32,000.

Ottawa, Ont.

Messrs. Farley, engineers, report that a number of bridges in Carleton County may have to be reconstructed.

Peterborough, Ont.

The C. P. R., it is reported, has bought considerable property along the waterfront.

Park Head, Ont.

Tenders are being called until April 30th for the erection of a bridge on the Sauble river, concession 8, township Amabel. Plans, etc., at residence of S. Doubt, and also at Councillor Ashley, Wiarton.

Quebec, Que.

The bridge over the Chaudiere at Scott, formerly a part of Ste. Marie de la Beauce, has been declared unsafe.

Regina, Sask.

Tenders will be received until April 29th for building reinforced concrete bridge abutments over the Qu'Appelle river. F. J. Robinson, Deputy Minister, Department of Public Works.

Revelstoke, B.C.

It is stated that the capacity of the C. P. R. shops will shortly be increased and necessary additions to the buildings be erected.

Saskatoon, Sask.

The C. N. R. has decided to double the capacity of freight sheds and to erect sheds also on the west side of the river.

Tenders will be received until April 29th for laying 2,160 square yards of asphalt block paving and creosoted plank subfloor on the traffic bridge at Saskatoon. F. J. Robinson, Deputy Minister of Public Works, Regina.

Township of McGillivray, Ont.

Tenders will be received by J. Drummond, township clerk, or M. Miller, reeve, until May 2nd for the erection of four cement bridges. Specifications at former's residence.

Toronto, Ont.

The T & N. O. Railway are calling for tenders until May 11th [illegible] Depot. [illegible] See advertisement in this issue.

It is stated that in order to secure an entrance independent from either the G. T. R. or C. P. R., the T. & N. O. will con[illegible] tion to North Bay.

Vice-president D. McNicoll of the C. P. R. states that construction work will short[illegible] on the branch line from [illegible]lington to Mimico, five miles.

Victoria, B.C.

Tenders addressed to [illegible] divisional engineer, will be received until April 30th for clearing of the right of way Comox extension, Esquimalt & Nanaimo Railroad between Union Bay and Oyster river. Specifications, etc., at office of above. H. E. Heasley, superintendent.

Woodstock, Ont.

Tenders are being called until May 7th for erection of one 125 foot steel bridge, etc. F. J. Ure, county engineer. See advertisement in this issue.

Winnipeg, Man.

Tenders for bridge over Assiniboine will be received until May 7th by H. Tillman, secretary-treasurer, Ellice municipality, at whose office plans, etc., may be seen, also at Department of Public Works.

Tenders are called until May 2nd for ditching work between Fort William and Winnipeg. Frank Lee, division engineer.

AWARDED.

Brantford, Ont.

The City Council let the contract for a reinforced concrete bridge over the canal at South Market street to J. Y. Harper, St. Thomas, $12,468.

London, Ont.

F. W. Farncomb, consulting engineer, has let to D. Whitherspoon, Ailsa Craig, on behalf of the Council of Lobo, a contract for concrete abutments, at $4.70 a cubic yard, and reinforced doors for two steel bridges, at 20 cents a square foot.

Ottawa, On.t.

The tenders for iron railing on viaduct were as follows: Trudel & McAdam, $897; the International Marine & Signal Company, $750; T. Lawson & Son, Limited, $140; and J. J. Enright, $132.

As a mistake was made by J. J. Enright in figuring for the railing for the Wellington street viaduct, the contract for the work has been awarded to the International Marine Signal Company.

Regina Sask.

The contract for the pile work and construction of the reinforced concrete abutments for the Albert street subway has been awarded to the Parsons Construction Company of this city, at about $75,000.

The excavation work for the Albert street subway will be done by the Canadian Pacific Railway, whose tender was accepted.

Toronto, Ont.

Peter Nicholson, of North Bay, has been awarded the contract for construction of bridge abutments at mile post 48.91, and construction of substructure for steel trestle over Wabis river at mile post 119.13.

Wells & Gray, 315 Confederation Life Building, were awarded the contract for the piers and abutments in the Wilton ave[illegible]

Vancouver, B.C.

The sub-contract for the 20-mile section of the Princeton-Abbottsford line has been awarded to Martin, Welch & Company.

Winnipeg, Man.

The C. N. R. have awarded contracts as follows: Extension of Oak Point line, Cowan Construction Company; extension of line west and northwest from Prince Albert, C. J. Murray; Thunder Hill branch, J. McMillan Bros.

The contract for the McPhillips street subway was let by the C. P. R. to John Gunn. Contract, $75,000, calls for completion about July 15. The work will re[illegible]

Public Buildings, Churches, Schools, etc.

Aylesford, N.S.

Tenders are being called until April 30 for the building of Methodist church here. Plans, etc., on application to J. F. McMahon, care of F. E. Harris & Company, Limited.

Calgary, Alta.

An effort is being made by some prominent people here to organize a large undenominational university in this city.

The city council will be asked to submit to the ratepayers a by-law for $50,000 to pay for the construction of a permanent horse show building.

Dufferin, Man.

The ratepayers will vote on a bylaw on May 4th to issue $2,500 school debentures. F. W. Kirby, secretary-treasurer.

Dunnville, Ont.

The ratepayers carried the by-law to spend $30,000 for a new high school building.

Edmonton, Ont.

The Haughes branch of the Lutheran Church have decided to build a college in Alberta, and a committee of that church are now looking for a desirable location. Ryley and Kingman have offered free sites. Tofield and Edmonton will also make offers and it is understood that Camrose will offer a choice of two free sites as an inducement to locate the college there.

Emo, Ont.

Tenders addressed to W. W. Schweitser, secretary-treasurer S. S. No. 5, Lash, will be received until May 5th for the erection of a 2 storey school house, 34 x 40 feet, with basement. Plans, etc., at office of the architect, Mr. Wastell, Fort Frances, or at office of the above mentioned.

Erindale, Ont.

Tenders are wanted at once for erection and completion of St. Peter's Church. Plans, etc., at Edwards & Saunders, architect, 18 Toronto Street, Toronto.

Fernie, B.C.

The congregation of Christ church (Anglican) are contemplating erecting a handsome edifice in the near future.

Fort William, Ont.

Competitive preliminary plans for the proposed library will be received until May 16th under "nom de plume" only, by John Whitehurst, chairman, property committee, 113 Dease street.

Hull, Que.

A committee, composed of M. Mousseau, Dr. Betisle, F. A. Labelle, Rev. Father Duhaut and others, has been appointed to confer with the city council as to the erection of a hospital.

Kaslo, B.C.

Instructions have been issued by the department of public works for the preparation of plans for the new government offices here, it being the intention of the government to invite tenders for this structure at an early date. Estimates for such, $20,000. E. Criddle, government architect.

Kipling, Sask.

J. Sproat, secretary-treasurer, school board, writes that no tenders were received for erection of school. Arrangements have been made with A. F. Nesbitt, architect, to build.

Kildonan, Man.

Kildonan school board intend to carry out the educational requirements of the district, notwithstanding the by law sub [illegible] last month was [illegible]. A site has been secured and a contract price for the erection of the building has been fixed at $[illegible].

London, Ont.

The building committee of the Western Fair have recommended the erection of a new building for cement exhibitors.

The trustees of School Section No. [illegible] have authorized the expenditure of $[illegible] to increase the accommodation in the building. Noted in last issue.

Midland, Ont.

The Roman Catholics of Midland will erect a new and much bigger church this summer on present site.

Moose Jaw, Sask.

Tenders are being called until May 7th for the erection of Land Title Building here. Architects, Storey & Van Egmond, Regina. See advertisement in this issue.

Montreal, Que.

The authorities of the French Maternity Hospital expect shortly to erect a large new hospital building.

A building permit has been issued to Protestant Commissioners for school, Peel street, $178,000; School Commisioners of Hochelago, 16 Desery, one school, $48,000.

Mr. W. E. Doran, architect, 180 St. James street, is preparing plans for a new hospital building to be erected at Chatham, N.B., for the Sisters of the Hotel Dieu.

It is stated that the Prince of Wales Fusiliers will erect an armory building at the southeast corner of Esplanade avenue and Rachel street at a cost of $120,000.

The School Commissioners of Maisonneue will erect two new school buildings, one on Latourneau street and one on Second avenue. Plans are being prepared by Mr. C. A. Reeves.

The School Commissioners of Ville St. Paul have decided to rebuild the recently destroyed Academy School Building, upon a new site. They also plan the erection of a new Academy for girls. It has been decided to offer the recent site o. the Boys' Academy to the town council for the purpose of erecting a town hall.

Moncton, N.B.

Plans have been ordered for a new school building in the west end. Chairman Hawke is interested.

Nakusp, B.C.

Mr. Miller, government, inspector of schools, has appointed Messrs. Jordan, Edwards and Peters as a building committee for [illegible].

New Westminster, B.C.

J. Cunningham has offered a building site on Royal avenue to the Y. W. C. A. Canvass for funds for an institution will be postponed until after the Y. M. C. A. campaign.

North Vancouver, B.C.

The Presbyterian church intends to establish a second congregation. A site has been secured at the corner of Twenty-fourth and Chesterfield. Rev. J. D. Gillam, pastor.

Orillia, Ont.

J. H. Robertson, architect, has called for tenders for erection of Sunday school building for the Methodist church, Peter street.

Ottawa, Ont.

It is probable that Mechanicsville will have a new public school this fall. Trustees, J. Salmon, Leme and W. Burton.

Peterborough, Ont.

W. Blackwell's plans for the isolation hospital have been approved by the Property Committee, and tenders will be asked for. Aldermen Graham and Morgan are interested.

Portage la Prairie, Man.

Tenders addressed to R. Rogers, Minister of Public Works, will be received until May 3rd for the erection of the "Old Folks' Home." Plans, etc., on application to the Provincial Architect, Government Telephone Buildings, Winnipeg.

Prince Rupert, B.C.

Munro & Bailey have completed plans for hospital, tenders for which will be called shortly.

Renfrew, Ont.

An extension to the hospital is being considered.

Revelstoke, B.C.

Tenders addressed to T. W. Bradshaw, secretary, Board of School Trustees, will be received until May 9th for the erection and completion of an 8 room brick and concrete school building (exclusive of heating and ventilating). Plans, etc., at offices of the secretaries at Vancouver, Kamloops, Calgary, Alta., and at the office of the architect, William King, this place.

Sarnia, Ont.

A. Darvill, chairman Public Buildings Commision, Alvinston, Ont., will receive tenders until April 30th for improvements on court house here.

Saskatoon, Sask.

The council are asking for plans of a new hospital, the cost of which will be covered by a bylaw to be submitted to the ratepayers. A similar bylaw for $110,000 was recently defeated.

Tenders addressed to W. P. Bate, secretary, Box 1406, will be received until May 3rd for the erection, exclusive of plumbing, heating and ventilation of school. David Webster, architect, this place.

Smith's Falls, Ont.

The bylaw granting $10,000 towards the erection of the hospital was carried.

Strathcona, Alta.

Messrs. Ritchie and J. J. McKenzie were appointed to decide upon the best site for the new 4 room brick school, which is being considered.

Stratford, Ont.

Pounder Bros. have started work on the new Registry office, which is to be of white brick, 34 x 50 feet.

The council decided to ask for new plans for the residence of cemetery superintendent, cost not to exceed $2,400. The tender of Fink & Pletsch called for $2,870.

St. John, N.B.

Tenders were called on the 25th for repairing and painting exhibition building.

F. Neil Brodie, architect, 42 Princess street, called for tenders on the 25th inst. for mason work required in the erection of addition to Out-Door Dept. of General Hospital.

Toronto, Ont.

Tenders will be called shortly for the new wing of Osgoode Hall, for which the Provincial House voted $50,000.

A permit for the erection of a three-storey addtiion to the Kimberley avenue school, $35,000, has been issued.

It is understood that the Knights of Columbus have bought the corner of Sherbourne and Linden streets as a site for a club house. Mr. Geo. McCullough is interested.

Tenders are being called until May 2nd for the several trades required in the erection of Oakwood High School, St. Clair and Oakwood avenues. See advertisement in this issue.

The Metropolitan Church trustees have decided to make extensive improvements in the church building, $30,000. The work will be commenced as soon as the contracts are let, which will probably be in June.

Tenders addressed to G. R. Geary, mayor, will be received until May 2nd for the tearing down and removal of sundry buildings now at Exhibition Park. Information at Parks Dept., City Hall.

The carpentering work of the reconstructed wing, as well as the new addition to the Parliament Buildings, is to be done by day labor, with Contractor Thos. V. Gearing in charge. Cost, $40,000 or $50,000.

The Toronto Branch of Canadian Manufacturers have proposed a plan by which $50,000 may be raised as a residence for young women coming into the city to work in different industries. T. Roden, 127 Dunn avenue, chairman; H. D. Scully, secretary.

Victora, B.C.

A new court house is needed. The erection of a law court building has been suggested as a remedy.

Whitby, Ont.

Tenders addressed to J. A. Harvey, architect, 502 Manning Chambers, Toronto, will be received until April 30th for each trade required in the enlargement of county court house. Plans at office of J. E. Farewell, K.C., County Crown Attorney, or at the office of the above.

Winnipeg, Man.

J. H. Trembly has submitted a tender of $12,000 for a Ruthenian school.

The council voted in favor of purchasing a site on Rupert street for a fire alarm signal station.

The Y. M. C. A. have purchased a site on Selkirk avenue, corner of Powers, on which they propose to erect a $20,000 building.

At the annual meeting of the congregation of All Saints, a committee was appointed to consider the building of a new church. Hon. secretary-treasurer, A. H. Young.

Tenders are being called until May 14th for purchase of $40,000 5 per cent. 20-year school debentures for district of Britannia, No. 1517. For further particulars apply to H. F. Tench, secretary-treasurer, King Edward P.O.

Woods Lake, B.C.

Tenders addresed to Minister of Public Works, Victoria, will be received until May 3rd for erection of small school here; also for erection and completion of two-room school at West Fernie. Plans, etc., at offices of government agents, Vernon, Fernie and at Department of Public Works.

Woodstock, Ont.

The by-law to authorize debentures for $10,000, for the purpose of finishing the erection of new schools has been passed.

AWARDED.

Dunnville, Ont.

Munro & Mead, the Hamilton and Brantford architects, have been awarded the contract for the new $30,000 high school at Dunnville.

Headingly, Man.

C. W. Johnstone, secretary-treasurer S. D. No. 2, writes that the successful competitor for plans for the new 2 room school house here is A. F. Nesbitt, architect, Shoal Lake, Man.

Levis, Que.
Joseph Couture, of this town, has been awarded the contract for the construction of a new stone church at Causapscal, $39,000.

Montreal, Que.
The general contract for the erection of the Saskatchewan University Buildings has been definitely awarded to Smith Bros. & Wilson, Regina. The contract for plumbing, heating and power installation went to Mr. James Ballantyne. Brown & Vallance, architects.

Quebec, Que.
The Commisioners have awarded the contract for the erection of a storehouse, containing police station on the crosswall, to Jinchereau & Lamonde, contractors. The plans of the new station have been fully approved by Chief Trudel, of the City Police.

Regina, Sask.
It is understood that the contract for the new Grey Nun's hospital has been let to Lyall & Company, of Winnipeg, $100,000.

Sydney, N.S.
The following is a list of tenders received for the erection of the academy here: Falconer & McDonald, of Halifax, $64,000, according to the specifications required, and for $1,035 less if faced with the pressed slag brick of the Sydney Pressed Brick Company; Thomas Cozzolino, $58,200; F. L. Dixon, $50,200, for Nova Scotia red pressed brick, and $58,300 for Sydney slag cement pressed brick. Messrs. Rhodes, Curyy & Company submitted three offers, as follows: Nova Scotia red pressed brick, $53,800; Nova Scotia red pressed brick with Sydney slag cement brick trimmings, $52,300; Sydney slag cement brick with stone lintels and quoius, $51,800. Indirect instead of direct heating, $200 extra. Chappel Bros. & Company, Limited, forwarded the following propositions: Nova Scotia red pressed brick, $52,300; Sydney gray slag cement brick face stock red brick backing, $51,640; indirect heating $220 additional. With Sydney pressed brick used throughout the walls, stone trimmings and indirect heating system the total of Messrs. Rhodes, Curry & Company's tender was exactly $52,000. A motion was unanimously adopted awarding the contract to this firm, with the five year guarantee of the brick product as a proviso. Building to be ready for occupation by December 31st, 1910. Architect, McDonald.

Toronto, Ont.
Contracts for the construction of the Howland avenue fire hall have been awarded as follows: Masonry, John McMurren, $12,441; carpentering, Thos. Lewis, $5,200; plumbing, Fred Armstrong Company, Limited, $785; electric wiring, Fred Armstrong Company, $250; roofing, Flowers and St. Leger, $65 ; painting and glazing, Hanna & Nelson, $950; heating, W. Schulkins, $1,115; total 21,861.

Victoria, B.C.
The contract for the new school house at East Arrow Park has been awarded to Jas. Dancey at $1,780.

Contracts for the erection of three new schoolhouses were recently awarded by the Provincial Minister of Public Works as follows: At Chase, two roomed school, $3,824.90, A. McConnell; at Aberdeen, Chilliwack, one room large, at $1,7[illegible], to Angus McLean, and at East Arrow Park, one room large, at $1,780, to Jas. Dancey.

Residences

Brandon, Man.
Building permits were granted recently to F. Lissaman for the erection of two frame residences on Fourth street, to cost $2,600 each.

Building permits were issued to W. A. Cochrane for the erection of a brick residence on Louise avenue, $3,000, and to H. Gillespie for the erection of a frame residence on 16th street, $3,000.

Brantford, Ont.
Building permit has been issued to Hugh Howie, jr., for the brick dwelling on Chestnut avenue, $4,800.

Building permit was issued to Mr. E. Swartout, for a brick dwelling on Northumberland street, $3,500.

Galt, Ont.
The old opera house block in Galt, recently gutted by fire, is to be converted into 14 suite apartment houses, cost $25,000.

Hamilton, Ont.
Building permit was granted recently to J. F. Sharp, brick dwelling on George street, for T. H. Knowles, $3,000.

Montreal, Que.
Tenders are being received for erection of a residence at Jesus Island on Riviere LaPrairie, for Mr. P. E. Nadeau, Alphonse Piche, architect.

Hilder Daw Construction Company are erecting five residnces on Bellevue avenue, Westmount.

Plans have been prepared and tenders are being invited for the erection of a residence on Westmount boulevard for J. A. Cameron. Messrs. Saxe & Archibald, architects.

Ottawa, Ont.
A new manse in connection with St. Paul's Presbyterian church is to be erected. Rev. J. Little, pastor.

Recent building permits include: F. L. Campbell, brick veneer apartment house, Preston street, $10,000; Jos. Forget, brick veneer apartment house, St. Patrick street, $4,500; Albert Blyth, brick veneer dwelling, Park avenue, $4,300; Geo. Spratt, brick veneer dwelling, Spadina avenue, $2,000; C. E. McDougall, brick veneer addition to dwelling, Besserer street, $2,500; Philip Lennon, brick veneer, row of dwellings, Percy street, $6,000; W. Gardner, double brick veneer dwelling, Bell street, $3,000; E. P. Stanton, brrick veneer dwelling, Nelson street, $3,400; Robert Booth, brick veneer dwelling, Elm street, $2,000; N. Copeland, double brick veneer dwelling, Hinton avenue, $3,500; A. H. Grison, brick veneer dwelling, Regent street, $4,500; James Maloney, brick veneer dwelling, Cobourg street, $3,000; John Gilmour, row of four brick veneer dwellings, Nelson street, $7,000; C. Pattison, brick veneer dwelling, Pansy avenue, $2,000; W. H. Thompson, brick veneer dwelling, Eccles street, $2,000; Philip Lennon, row of four brick veneer dwellings, Percy street, $6,000; Wm. Gardner, double brick dwelling, Bell street, $3,000.

Outremont, Que.
Recent building permits include: [illegible] Black, two houses, McDougall avenue, cost $16,000; Mr. MacLean, one house, Rockland avenue, cost $24,000; A. Scarrett, six houses, Querbes and Fairmount avenue, cost $33,000.

Owen Sound, Ont.
Tenders were called until 27th inst for residence on [illegible] & Clark, architects.

Souris, Man.
The Board of Trade is considering the formation of a loan and building association as a means of supplying the need of houses of a better class here.

Toronto, Ont.
Mr. Amos Shunk has obtained a permit for the erection of a three storey apartment house on the southeast corner of Palmerston avenue and Herrick street, $20,000.

Mr. D. B. Hanna has been given a permit for residence on Castle Frank avenue, $28,000.

Vancouver, B.C.
Jones & Aspell, 347 Pender street, are the architects in charge of the residnce being erected at Shaughnessy Heights for Mr. H. A. Edgett.

Wright, Rushford & Cahill, Tunstall block, 709 Dunsmuir street, are the architects for the 6 storey apartment house on Davis and Jervis streets of pressed brick, 131 x 111 feet; cost, $175,000.

Victoria, B.C.
Building permits have been issued to H. T. Knott for a frame one and a half storey dwelling, on Harbinger avenue, $3,000; F. Clark, two storey dwelling with six rooms on Pandora avenue, $2,500.

Winnipeg, Man.
Tenders are called until the 27th inst. for residence on Oakwood avenue for A. R. Burt. W. Bruce, architect, 222 McDermot avenue.

M. Le Page has received a permit to erect an apartment block on Balmoral street, between Ellice and Sargent avenue, $10,000; also to W. W. Cross, apartment block, southwest corner Dorchester and Lilac streets, $40,000.

Tenders addressed to W. Wallace Blair, architect, 400 The Nanton Building, will be received until April 30th for the following trades required in the erection of the Rostrevor apartment building, plumbing and heating, sheet metal and roofing, painting and glazing, electric wiring and conduits, cut stone work, marble and tile work and lathing and plastering. Plans, etc., at office of the above.

AWARDED.

Fort William, Ont.
Alf. Cusson has been awarded the contract for residence, corner Ridgeway and Catherine streets, for F. R. Morris, $15,000; Cameron & Son has secured the contract for the plumbing, and Anderson Company the heating. Architect, R. E. Mason.

Galt, Ont.
Thomas & Hancock have just closed contracts for several houses: Mrs. J. Allan, on Aberdeen road; James Bennett, on Hopeton street, brick; and for a double brick on Bond street for Mrs. McDonald. Mr. P. Nicol has the carpenter work.

Montreal, Que.
Contract for carpentry work, residence for Mr. Darling, has been awarded to J. N. W. Morrison. J. R. Gardner, architect.

Contract for the concrete work, residence, Summerville avenue and Victoria avenue, for Mr. Biltelisse, has been awarded to S. Whittaker. MacDuff & Lemieux, architects.

Contracts have been awarded as follows: Residence, [illegible] avenue, Westmount, [illegible] H. E. McIntosh; excavations, Ward & Baldeck; carpentry, A. E. Fraser. Remaining trade to be let later.

Contract for [illegible] on Colborne street for Col. J. Carson has

(Continued on page 31)

Tenders and For Sale Department

COUNTY COURT HOUSE

TENDERS WANTED

[illegible] A. [illegible], architect, [illegible] will be [illegible] required [illegible] the County Court House [illegible]

[illegible] necessarily accept-ed.

[illegible] Duwell [illegible] or the architect's office, Toronto. 17

Board of Education

Tenders Wanted

Sealed tenders addressed to the Secretary [illegible] of the Board will be received until [illegible] NOON, MAY 2ND, 1910, for the several trades required in the erection of

The Oakwood High School

St. Clair and Oakwood Avenues

Plans and specifications may be seen and all [illegible] at the office of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in the said specifications [illegible] of tender. The lowest or any tender will not necessarily be accepted.

W. H. SMITH, W. C. WILKINSON,
[illegible] Committee. Sec-Treas.

Land Titles Building

Moose Jaw

Sealed tenders, endorsed on envelop "Tenders for Land Titles Building, Moose Jaw," will be received up to 1 p.m., SATURDAY, MAY 7TH, 1910, for the erection of a Land Titles Building on lots 36 to 40, in block 78, Moose [illegible]

Each tender must be accompanied by an accepted cheque for $3,000, made payable to the Minister of Public Works, which cheque will be forfeited if the tenderer fails to execute the contract and bond when requested to do so.

The deposit of the unsuccessful tenderers will be returned when the contract is signed.

The right to reject any or all tenders or to waive any defects or irregularities therein is to be at the discretion of the Minister of Public [illegible]

Plans, specifications, form of tender, and all information may be obtained on application to the undersigned, or to Messrs. Storey and Van Egmond, architects, Regina.

A deposit of $10 must be made for the removal of plans from the office, as a guarantee of their return.

The unauthorized insertion of this advertisement will not be paid for.

F. J. ROBINSON,
Deputy Minister.

Department of Public Works, Regina,
April 20th, 1910.

Tenders for
Steam Roller

Will be received at this office up to 4 o'clock on THURSDAY, MAY 5TH, for a Steam Roller of 12 or 15 tons.

ALD. J. A. TANCOCK, A. D. GRAYDON,
Chairman No. 2 Committee. City Engineer,
17 London, Ont.

TENDERS
for Reinforced Concrete Arch and Viaduct

Tenders will be received by Wm. Panton, County Clerk, Milton, Ont., up to twelve o'clock noon of TUESDAY, MAY 3RD, 1910, for the construction of a Reinforced Concrete Arch of 135 feet span, and 340 feet of Concrete Viaduct Approach, on the Middle Road, between the Town of Oakville and the Township of Trafalgar. Also alternative tenders will be received as above for Concrete Piers and Abutments for a Steel Bridge for the same site.

Plans and specifications may be seen and all necessary information may be obtained at the offices of the undersigned, at Guelph, Ont., or of Jas. C. Ford, Reeve of Oakville, or of Barber and Young, consulting engineers, 57 Adelaide street east, Toronto,

The lowest or any tender not necessarily accepted.

JAS. HUTCHEON,
County Engineer for Halton.
Guelph, April 16th, 1910. 17

Temiskaming and Northern Ontario Railway Commission

Sealed tenders addressed to the undersigned will be received up to noon, MAY 11TH, for the following works:

(A) Construction of three revised standard sectionmen's houses at Gillies Depot, Uno Park, and Charlton. Tenders to be marked on envelope, "Tender for Sectionmen's Houses," and to be accompanied by certified cheque on chartred bank of Canada for the sum of five hundred dollars ($500).

(B) Construction of one or more standard sectionmen's houses for bachelors, situated along the line of the T. and N. O. Railway, between North Bay and Cochrane, tenders to be marked on envelope, "Tenders for Sectionmen's Houses for Bachelors," and to be accompanied by certified cheque on chartered bank of Canada for the sum of one hundred and fifty dollars ($150).

Plans and specifications may be seen and forms of tender obtained at the office of the secretary-treasurer, 25 Toronto street, Toronto, and at the office of the chief engineer, North Bay.

The lowest or any tender not necessarily accepted.

A. J. McGEE,
Secretary-Treasurer.

Papers inserting this advertisement without authority will not be paid for.

25 Toronto street, Toronto, April 22nd, 1910.
18

Town of Sault Ste. Marie, Ont.

Notice to Contractors

Sealed tenders will be received by the Town Clerk, C. J. Pim, addressed to T. E. Simpson, Mayor, Soo, Ont., endorsed "Tender for Cement Walks," up till noon on MONDAY, MAY 2ND, 1910, for the furnishing of all materials for, and the construction of approximately One Hundred and Thirty-Eight Thousand (138,000) square feet of Cement Concrete Sidewalk.

Specifications and instructions to bidders to be seen at the office of the Town Engineer, Town Hall, Sault Ste. Marie, Ont., on and after April 15th, 1910.

The lowest or any tender not necessarily accepted.

T. E. SIMPSON, Esq., W. F. GRANT, C.E.,
17 Mayor. Town Engineer,

TENDERS FOR BRIDGE

Sealed tenders will be received by the undersgned up to 2 p.m. on SATURDAY, THE 7TH DAY OF MAY, for the erection of one 125 foot steel bridge with concrete abutments and also for a 30 feet reinforced concrete arch, to be erected near Plattsville. Plans and specifications may be seen at my office in Woodstock or at the office of F. Vickerl, Reeve, at Princeton.

The lowest or any tender not necessarily accepted.

F. J. URE, County Engineer,
17 Woodstock, Ont,

City of Winnipeg Electrical Distribution System

Tenders for Conduit and Sub-Stations

Sealed tenders on prescribed forms, addressed to the Chairman of the Board of Control, Winnipeg, Canada, and marked on the envelope "City of Winnipeg Electrical Distribution System—Tender for " will be received at the offices of the undersigned up to 11 a.m., on MONDAY, 16TH MAY, 1910, for the following items:—

No. 51. Conduit.
No. 52. Construction Conduit Runs, 1910.
No. 53. Sub-station Transformer and Switching Apparatus.

Copies of the plans, specifications, and forms of tender will be obtained at the Power Engineer's Office, Carnegie Library Building, Winnipeg.

These specifications may also be examined at the offices of Messrs. Smith, Kerry & Chace, Confederation Life Building, Toronto, Ont,

Each tender must be accompanied by a certified cheque, as set forth in the "Instructions to Bidders" which cheque will become forfeit to the Corporation in the event of the successful tenderer refusing or neglecting to sign a satisfactory contract when called upon so to do.

The City reserves the right to reject any or all tenders, or to accept any bid which shall appear advantageous.

M. PETERSON,
Secretary.

Office of the Board of Control,
Winnipeg, April 14th, 1910. 17

City of Vancouver

Tenders for

Garbage Destructor Plant

Tenders will be received by the undersigned up to 3.00 p.m., TUESDAY, THE 31ST OF MAY, 1910, for the installation of a Garbage Destructor Plant at the Bridge street yard, on the south side of False Creek in the City of Vancouver, British Columbia. The plant must be capable of destroying not less than seventy tons of mixed garbage per day of twenty-four hours.

Tenderers will be required to submit plans and specifications with their proposals and furnish a satisfactory bond and guarantee that the destructor will fulfill all the provisions of the specifications.

The tendered price is to include the erection of the stack and all necessary buildings.

A deposit of an amount equal to 5 per cent. of the contract price must be made with each tender by marked cheque payable to the City Treasurer.

The lowest or any tenders not necessarily accepted.

W. McQUEEN,
City Clerk.

19

Intercolonial Railway Tender

Sealed tenders addressed to the undersigned, and marked on the outside, "Tender, Railway Nelson to Chatham," will be received up to and including TUESDAY, MAY 10TH, 1910, for the construction of a line of railway between Nelson and Chatham (N.B,), a distance of about 8.28 miles.

Plans and specifications may be seen at the Station Master's Office, Chatham (N.B.), at the Chief Engineer's Office, Moncton (N.B.), and at the office of the Secretary of the Department of Railways and Canals, Ottawa (Ont.), where forms of tender may be obtained.

All the conditions of the specification must be complied with.

A. W. CAMPBELL,
Chairman
Government Railway Managing Board,
Ottawa, Ont., April 12th, 1910. 18

Positions Vacant

Advertisements under this heading two cents a word per insertion.

WANTED—First class general foreman or superintendent by a firm of general contractors with head office in Winnipeg, Manitoba. Must understand all kinds of contractors' machinery and be able to handle all kinds of concrete work, coffer dams, etc. A steady position for the right may. State salary expected and give references. Address Box 969 "Contract Record," Toronto. 18

Miscellaneous

Advertisements under this heading two cents a word per insertion.

FOR SALE.—Van [illegible] and Post Office Fixtures at half price. Apply to H. Weller, Welland, Ont. 18

FOR SALE—Eighty-eight (88) pieces of Lackawanna Steel Sheet Piling, twenty-two (22) feet long, twelve and three-quarter (12¾) inches wide, three-eighths (⅜) inch thick. WM. LESSLIE, Walkerville, Ont.

AGENTS WANTED—[illegible] manufacturers of a well-known waterproofing compound wish to get in touch with reliable firm or individual to represent them in [illegible] desirable opportunity for [illegible] young architect or engineer. Box 970 "Contract Record." 20

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra.

QUARRY MANAGER, ENGINEER, 32, at present in charge of marble quarry and works, accustomed to preparing for the market, building and decorative stores, wishes modest appointment, would consider partnership in small quarry. Apply "Scott," care Street's Agency, 30 Cornhill, London, England. 18

Public Buildings, Churches, Schools, etc.

(Continued from page 29)

been awarded to Peter Lyall & Sons Limited. The contract for residence, Columbia avenue, for Messrs. N. J. Pope has been awarded to F. M. Hoffman. J. H. Rodden, architect.

Contracts have been awarded as follows by Messrs. Hutchison, Wood & Miller for a residence Mr. D. W. Ogilvie, Summerhill avenue: Masonry and brickwork, John Stewart & Company; carpentry, D. M. Long; roofing, Campbell-Gilday Company; steel work, structural steel Company; plastering, E. H. Knott; wiring, Montreal Electric Company; painting, Hutchison & Stient; mantles, etc., G. R. Locker Company; interior decorating, G. E. Blackwell.

Business Buildings and Industrial Plants

Brandon, Man.

It is stated that the Cockshutt Plough Company .will erect a three storey warehouse, 80 by 100 feet, here. E. A. Mott, general manager; D. Shirriff, local agent.

It is reported that the contract for the interior fittings for the C. N. R. hotel has been awarded to the Hanbury Company; heating to Brandon Electric Light Company.

Tenders addressed to Frank R. Evans, 506 Somerset Building, Winnipeg, will be received until May 2nd for all trades(except plumbing, heating and electrical work) required in the erection and completion of a five storey reinforced concrete office building, corner of Rosser and Ninth, for Clement Bros. Plans, etc., at omce of Clement & Clement, this city, or at the office of the above.

Brantford, Ont.

The Waterous Engine Works Company are having plans prepared for additions to their factory.

The Crown Electrical Company, of St. Charles, Ill., manufacturers of electrical supplies and gas fixtures, will establish a branch factory in this city for the manufacture of [illegible]. Industrial Commissioner, Dowling. The factory will be erected at once.

Calgary, Alta.

Officials of Quaker Oats, of Chicago, have been negotiating as to the location of a [illegible] plant here.

A [illegible] map shows the entrance of the C. N. R. line on the same right of way as the G. T. P. into the city, and the same terminal site as the G. T. R., showing that the barracks property will be used [illegible] depot.

Cranbrook, B.C.

The sash and door factory will build a new mill beside their old one.

Creston, B.C.

The Rogers saw mill here was damaged by fire to the extent of about [illegible].

Chatham, Ont.

A large warehouse owned by Flavelles collapsed on the 22nd inst.

Dundas, Ont.

On May 16th the ratepayers will vote on a bylaw to guarantee $30,000 bonds of the proposed engine works.

Dunnville, Ont.

The ratepayers carried two bylaws: To loan $30,000 to the promoters of an industry for the manufacture of auto parts, furnaces, shovels and other articles; to grant a fixed assessment of $25,000 and free water for ten years to the Dominion Hammock Manufacturing Company.

Edmonton, Alta.

Edmonton Lumber Company's mill was destroyed by fire on the 20th inst. Estimated loss, $20,000. Owners, Minneapolis capitalists and W. H. Clarke, of this city.

Fort William, Ont.

J. B. Persee, of Tees & Persee, Winnipeg, has been looking for a suitable site for a branch warehouse.

Hamilton, Ont.

The premises of Taylor & Mulveney, Charles street, were damaged to the extent of about $6,000.

London, Ont.

A business block on Richmond street, occupied by Ryan & Russell, Regal Glove & Mitt Company, was damaged by fire on the 23rd inst. Total loss, $4,000.

Montreal, Que.

The Molsons Bank contemplate the erection of a new office building at corner Ontario and Lasalle street.

Plans for the Yorkshire Insurance Building are nearing completion, and the architects, Saxe & Archibald, expect to call for tenders shortly for erection of same.

Plans and specifications have been prepared and tenders will shortly be received for the construction of four modern stores, corner St. Andre and St. Catherine streets. W. E. Doran, architect.

Plans have been prepared for an extensive five storey manufacturing plant to be erected on Parthenais street. A further announcement will be made when it is definitely decided to go ahead with this work.

Moose Jaw, Sask.

Estimated cost of Dominion Bank branch (on which tenders closed on 18th inst.), $60,000.

McAdam Junction, N.B.

Tenders are being called until May 2nd for building addition to station and hotel. Plans, etc., with G. L. Wetmore, division engineer, St. John, also with F. M. Rutter, resident engineer.

Nakusp, B.C.

It is reported that another saw mill is to be built here. Cleveland, Ohio, capitalists are said to be interested.

Port Arthur, Ont.

The city officials have signed a tentative agreement with the Canadian branch of the Ironclad Manufacturing Company, by which the company agrees to a site at the north end where steel barrels and enamelware will be made.

Prince Albert, Sask.

The [illegible] advertising for tenders for the erection of a $50,000 abattoir. Noted in issue of March [illegible]

Portage la Prairie, Man.

B. D. Keck, architect, of Crookston, Minn., has been here in connection with [illegible]

[illegible] Company. [illegible] noon of April 30th.

Prince Rupert, B.C.

The [illegible] will erect a building at the corner of Third avenue and [illegible] street, the Union Bank on the corner of Second avenue and Third avenue.

Quebec, Que.

A building permit has recently issued to [illegible] Cement Company, new building, [illegible] and [illegible] streets, [illegible].

Tenders are being called until the [illegible] inst. by [illegible] LeMay, [illegible] d'Aiguillon street, architects, acting for Quebec Railway, Light, Heat & Power Company, for the demolition of [illegible].

The Bank of Montreal have purchased [illegible] feet of land, corner St. John and [illegible] streets, and will in the near future erect a modern office building. (Confirmed by Montreal head office, architect not yet decided.)

The [illegible] Steel & Iron Works, Limited, is shortly to erect here a plant for the manufacture of structural steel for buildings, bridges, etc. The company has secured a large tract of land at St. [illegible], on the line of the C. P. R., measuring some 400,000 square feet, on which the workshops and other buildings will be erected. The plans for building are completed and it is expected that work on the structures will be commenced within the next ten days. Capital, $200,000. President, R. Forget; secretary-treasurer, J. T. [illegible]

Regina, Sask.

Tenders addressed to W. J. Uren, superintendent, will be received until April 30th for heating and plumbing of Regina freight shed. Plans at office of H. B. Sims, resident engineer Moose Jaw.

Revelstoke, B.C.

A $100,000 hotel in the business section of the city is being talked of.

Sarnia, Ont.

Conway & Murray, representatives of a Detroit stove manufacturing company, with large factory at Fremont, Ohio, will confer with the Board of Trade and council as to the location of a Canadian branch here. Mayor, A. J. Johnston.

St. Catharines, Ont.

The ratepayers voted on bylaws to grant exemption to the Canadian Crocker-Wheeler [illegible] Knitting Company and St. Catharines Woollen Mills Company.

St. Thomas, Ont.

Negotiations have been opened with this city by an Eastern Ontario woodenware concern as to removal here. Mayor Guest.

Tenders have been called for the several trades for erection of shoe factory for A. E. Medcalf. N. P. Darrach, architect.

The Norsworthy Company have purchased necessary land to enlarge their plant and will take steps very shortly to go on with the erection of the new buildings.

Toronto, Ont.

Gourlay, Winter & Leeming have obtained a permit for the erection of a four storey warehouse on Logan avenue, near Queen street; cost $68,000.

De Young & Company, haberdashers, it is reported, are contemplating the extension of their business, three branches in the city being talked of, as well as branches in other cities.

Vancouver, B.C.

Building permits have been issued to Leek & Company for brick building, [illegible] street, $61,000. H. Bell Irving & Company, brick office building, corner Railway and Cordova streets, $15,000.

J. W. Considine, of Seattle, is erecting a 10-storey office building above the opera house. When the latter's lease expires in December, 1912, the lower floors will be installed.

Property on the east side of Granville street, between Helmecken and Nelson streets has been purchased, it is said, as a building site for a large up-to-date business block. A. S. Cole (R. V. Winch & Company) effected the sale.

Vermillion, Alta.

A bylaw to bonus the flour mill of Wiebe & Son, of Langham, for $10,700 has been passed.

Victoria, B.C.

A building permit has been issued to the Dominion Realty Company for a two storey building, with concrete foundation, corner of Douglas and Bay streets, $7,000.

H. S. Griffiths is the architect for the block to be erected by the Westholme Lumber Company. T. A. Brydon, contractor, has commenced operations on the Lee building, corner of Fisguard and Government streets, $30,000.

Wadena, Sask.

Several proposals have come in to the Board of Trade re the building of a flour mill here. A municipal loan is being floated for the erection of a skating rink.

Wiarton, Ont.

The Commercial hotel was destroyed by fire on the 18th inst. Loss estimated at $4,500. A. Davis, proprietor.

Winnipeg, Man.

A building permit has been issued to the Eli Sand Company, Pembina street, for a factory, $50,000.

The T. Eaton Company have taken out a permit for $100,000 for extension of plant on east side of Hargrave; Alloway & Champion, office building, Main street, $33,000. Jordan & Over, architects.

The Dominion Tar & Chemical Company has purchased an additional thirty acres (total, seventy acres) for their proposed extensions.

Tenders addressed to W. Wallace Blair, architect, 400 The Nanton Building, this city, will be received until April 30th for the erection of an office building on Main street for T. D. J. Farmer. Plans, etc., at office of the above.

It is stated that the Bank of British North America has purchased the northwest corner of Bond and Regent streets, and the Bank of Toronto, the northeast corner. It is the intention of both these financial institutions to build.

AWARDED.

London, Ont.

Geo. Anderson & Company, Limited, Montreal, Que., have been awarded contract for electric travelling cranes in connection with the new works of the Geo. White & Sons Company. Installation some time in July.

Montreal, Que.

The contract for the excavation and foundation work, new Y. M. C. A. building, Drummond street, has been awarded to John Stewart & Company. Ross & Macfarlane, architects.

The contract for masonry and brickwork, Crescent Manufacturing Company's new plant, has been awarded to John Stewart & Company. Finlay & Spence, architects.

The Phoenix Bridge Company have been awarded the contract for steel work for the new store and warehouse building to be erected on St. Catherine street for H. P. Labelle & Company, Limited. G. A. Monette, architect. Other trades not announced.

The Atlas Construction Company have the contract for the erection of a 4 storey office and factory building, Mount Royal avenue and Clark street, for Messrs. Timmins, estimated cost $62,000. Mr. Philip Turner, F.R.I.B.A., has been appointed supervising architect.

Prince Rupert, B.C.

The Bank of Montreal has let the contract for a building to be used as offices for their business and residence for the manager to Westholme Lumber Company.

Toronto, Ont.

Contract for the sheet metal and roofing work on warehouse for Mr. F. Nicholas, King street west, has been awarded to A. B. Ormsby, Limited.

Contracts were awarded as follows for the Upper Canada Tract Society Building on College street: Masonry, Smallwood Bros.; structural steel, Dominion Bridge Company; fireproofing, Robt. Bennett; ornamental iron, Dennis Wire & Iron Works; carpentry work, A. Clark & Son; roofing, Duffy & Sons; iron windows, Aikenhead Hardware Company; plumbing and heating, F. Armstrong; marble work, Hoidge & Company; plastering, Blackburn & Son; plumbing and glazing, Conlan Bros.; mosaic flooring, Toronto Flooring Company. One contract not yet let. Gordon & Helliwell, architects, Confederation Life Building.

Welland, Ont.

Contractor Patton has the contract to erect a one storey cement block building, 50 by 135 feet, with cement foundation, for the Supreme Heating Company.

Winnipeg, Man.

It is stated that the contract for the interior finishing of the new C. N. R. and G. T. P. union station has been let to Lyall & Company, $300,000. Work to be completed by October.

Power Plants, Electricity and Telephones

Brockville, Ont.

Ratepayers voted the light and power department $50,000 for the purpose of improving and extending the town lighting system.

Bracebridge, Ont.

P. Hutchison, secretary-treasurer, Bracebridge & Muskoka Lakes Telephone Company, writes that owing to some changes having to be made the contracts have not yet been let, for the construction of line from Port Carlington Bala.

Brandon, Man.

The city council passed a resolution offering a contract to the E. B. Reese Engineering Company for the supply of power on switchboard at $20 per h.p., etc. Final arrangements to be completed at end of May, 1910.

Estevan, Sask.

The by-law authorizing the expenditure of $25,000 for a municipal electric light plant has been passed.

Lloydminster, Sask.

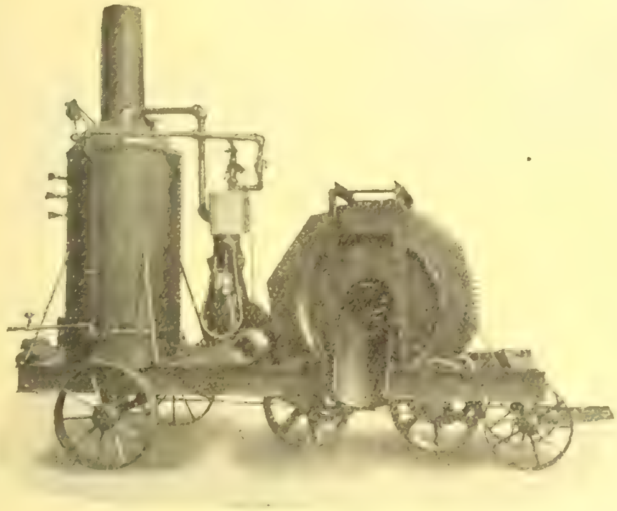
The ratepayers ratified a by-law passed by the town council granting a franchise for eight years to W. Johnson for the operation of an electric light plant.

Regina, Sask.

Electric light by-law was carried.

HADSEL

A mixer combining all the advantages of a continuous and is a batch mixer



The loading hopper on our one-half yard mixer has a capacity of one half-yard of **unmixed material.**

A strong feature. The gate between hopper and mixer is so arranged that while one batch is being mixed and discharged the laborers are busy filling the hopper.

When the mixing batch is discharged the engineer pulls gate allowing unmixed batch to run into mixer and then closes gate, immediately permitting reloading of hopper to proceed almost uninterruptedly.

ROGERS SUPPLY COMPANY

Phone Main 4155

Head Office: 3 King Street East, Toronto

Creosoted Wood Paving Blocks

cut from the log in our own mills out of live Douglas Fir and creosoted to specification as to Oil and Pressure. Capacity 1,000 yards per day.

Bridge, Structural and Mining Timbers

cut and sized to exact dimensions, and if so desired, framed in our yards before Creosoting.

Standard Creosoted Railroad Ties

Dominion Carbolineum Works Limited

Vancouver, B. C.

F

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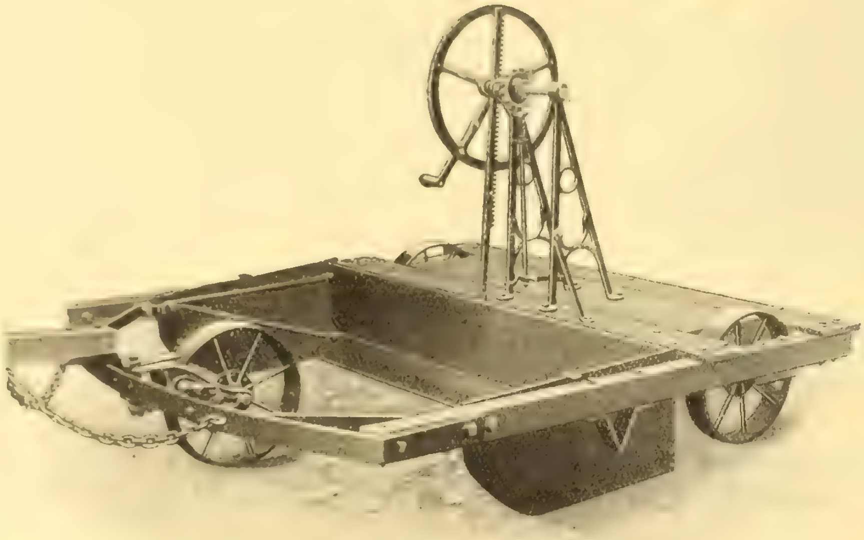
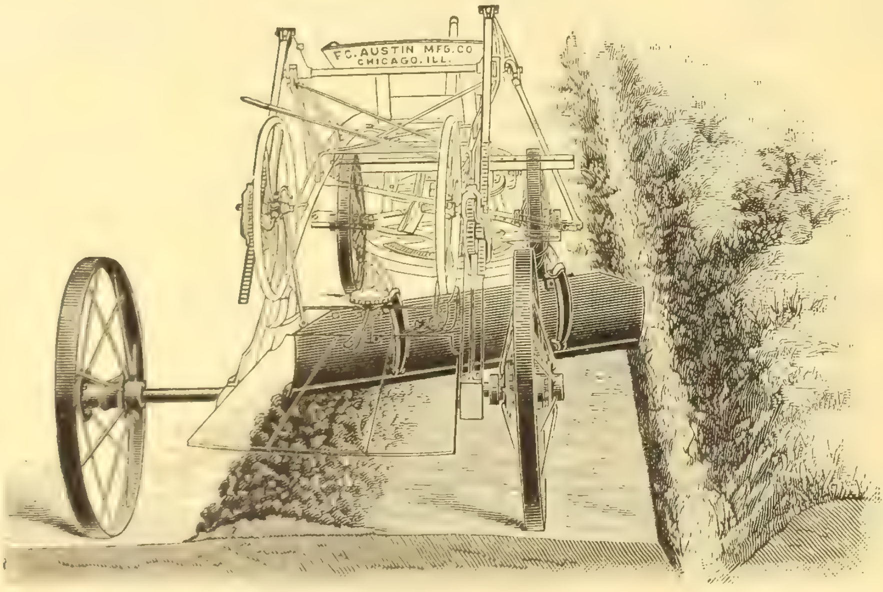
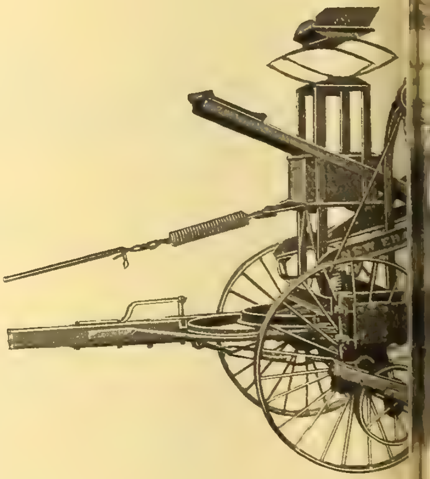
Graders, Ro
Sweepers, Sc



SHUART EARTH GRADER.



AUSTIN REVERSIBLE ROAD MACHINE.



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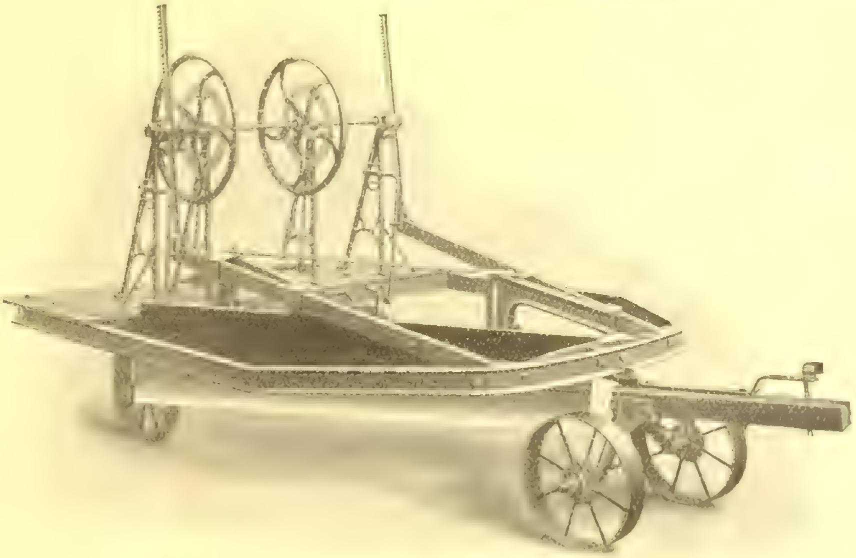
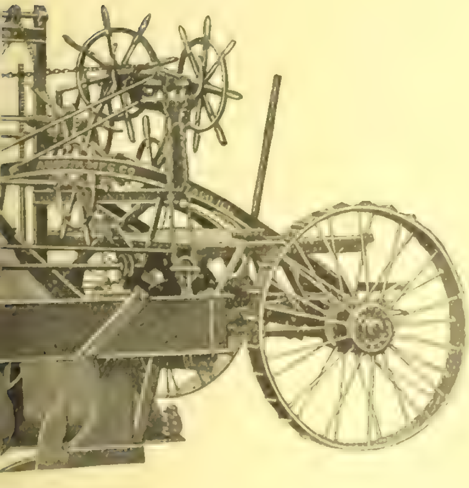


LITTLE YANKEE REVERSIBLE GRADER.



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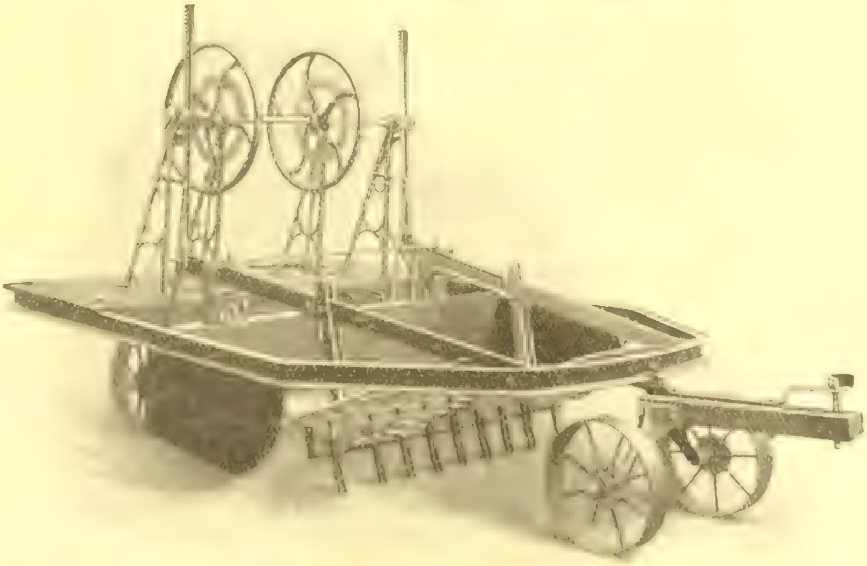

LITTLE YANKEE REVERSIBLE GRADER WITH DIGGER AND FENDERS.

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Winnipeg - 259-261 Stanley St.
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Vancouver - - Mercantile Bldg

Triangle Mesh Concrete Reinforcement

Continuous Bond—no Tying or Lapping Necessary. Made of Cold Drawn Mild Steel, Tensile Strength 90,000 lbs. per square inch, Elastic Limit 50,000 lbs. per square inch

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LONGITUDINALS SPACED 4-INCH CENTERS.
CROSS WIRES SPACED 4-INCH CENTERS.

Number and Gauge of Wires, Are as Per Foot Width and Weights Per 100 Square Feet.

Styles Marked * Usually Carried in Stock

Style Number	No. of Wires Each Long	Gauge of Wire Each Long	Gauge of Cross Wires	Sectional Area Long. Sq. In	Sectional Area Cross Wires	Cross Sectional Area per Ft. Width	Approximate Weight per 100 Sq. Ft.
*4.......	1	6	14	087	.025	102	43
[illegible]	1	8	14	.062	.025	.077	34
[illegible]	1	10	14	.043	.025	058	27
*7	1	12	14	.026	.025	.041	21
*23.......	1	¼"	12½	147	038	170	72
[illegible]	1	4	12½	.119	.038	.142	62
[illegible]	1	5	12½	.101	.038	.124	55
*26.......	1	6	12½	.087	.038	110	50
*27.......	1	8	12½	.062	.038	.085	41
[illegible]	1	10	12½	.043	.038	.066	34
29.......	1	12	12½	026	.038	.049	28
31.......	2	4	12½	.238	.038	.261	106
[illegible]	2	5	12½	.202	.038	.225	92
[illegible]	2	6	12½	.174	.038	.196	82
[illegible]	2	8	12½	.124	038	.146	63
35.......	2	10	12½	.086	.038	.109	50
[illegible]	2	12	12½	052	.038	.075	37
*38.......	3	4	12½	358	038	.380	151
[illegible]	3	5	12½	.303	.038	.325	130
[illegible]	3	6	12½	.260	.038	.283	114
41.......	3	8	12½	.185	.038	.208	87
[illegible]	3	10	12½	.129	.038	.151	66
[illegible]	3	12	12½	.078	.038	.101	47

LONGITUDINAL SPACED 4-INCH CENTERS.
CROSS WIRES SPACED 2-INCH CENTERS.

Number and Gauge of Wires, Areas Per Foot Width and Weights Per 100 Square Feet.

Styles Marked * Usually Carried in Stock

Style Number	No. of Wires Each Long.	Gauge of Wire Each Long.	Gange of Cross Wires.	Sectional Area Long.. Sq. In.	Sectional Area Cross Wires. Sq. In.	Cross Sectional Area per Ft. Width.	Approximate Weight per 100 Sq. Ft.
4-A....	1	6	14	.087	.050	.102	53
5-A....	1	8	14	062	050	.077	44
6-A....	1	10	14	043	.050	.058	37
7-A....	1	12	14	026	050	041	31
23-A....	1	¼"	12½	.147	.076	.170	86
24-A....	1	4	12½	.119	.076	.142	76
25-A....	1	5	12½	.101	.076	.124	70
26-A....	1	6	12½	.087	.076	110	64
27-A....	1	8	12½	.062	.076	085	55
28-A....	1	10	12½	.043	.076	066	48
29-A....	1	12	12½	026	076	049	42
31-A....	2	4	12½	.238	.076	261	120
32-A....	2	5	12½	202	076	.225	107
33-A....	2	6	12½	174	076	196	97
34-A....	2	8	12½	124	076	.146	78
35-A....	2	10	12½	086	076	109	64
36-A....	2	12	12½	052	.076	075	52
38-A....	3	4	12½	.358	.076	.380	165
39-A....	3	5	12½	303	.076	325	145
40-A....	3	6	12½	260	076	.283	129
41-A....	3	8	12½	185	076	208	101
42-A....	3	10	12½	129	076	151	81
43-A....	3	12	12½	.078	.076	101	62

Large Stocks carried for Immediate Shipment

W. D. Beath & Son, Limited

Toronto - Canada

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MACLEAN, Winnipeg, President
T. S. YOUNG, Business Mgr. JAS. FISHER, Advt. Mgr.
HOME OFFICE - Confederation Life Building, TORONTO
Telephone Main 2362
F. W. SCHERBARTH, Representative

MONTREAL Telephone Main 2299 B34 Board of Trad
HERBERT B. MUIR, Representative
WINNIPEG - Telephone 224 404 Travellers' Bldg.
R. F. HILL, J. R. HOOPER, Representatives
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Great Britain's Opportunity

The attention paid to the Canadian market by British firms is of such a desultory nature that it is really refreshing to note that one who is claimed to be a "competent authority" has been criticising in a popular London paper the "insular arrogance" of old country houses in treating foreign orders of all kinds. The writer quotes the unwise policy of a Sheffield firm as an example. The firm in question was approached by the representative of a Canadian wholesale hardware house concerning the supply of axes of a particular shape and weight suited to Canadian needs. There was nothing complicated about the requirements, and what was asked it was only reasonable for a progressive house to supply. But the firm demurred, and in the end the order went to the United States. Our "competent authority" waxes satirical in his criticism of such business methods and slates the Sheffield firm thus:

"They had been manufacturing axes of set pattern since the days of William the Conqueror. They had supplied axes for every public execution worth noting and they could show unsolicited testimonials from Henry VIII. and Cromwell. They saw no reason why Canadians should not adapt themselves to the models already stamped with the approval of the people of England."

Here is the secret of the whole thing. Canadians are disposed to encourage the British manufacturer, but they feel that it is up to the latter to adapt himself to their requirements and show the same amount of enterprise that they themselves have to show when competing in the United States and other foreign fields. We have in mind the case of a young salesman for a British firm interested extensively in municipal supplies and contractors' requirements. He had been assigned the Canadian territory and was looking for business between Montreal and Vancouver. He was affable enough and would like to have made contracts, but he was not only ignorant of the country but also of the lines he was trying to sell. He would admit that he could only give approximate prices and would have to obtain a proper estimate from headquarters. In the meantime, of course, other firms would be consulted and he would lose all chance of business. Eventually he was withdrawn from the field, his firm having concluded that the time was not yet ripe for Canada.

Such things as this affect not so much Canadian trade as England's commercial supremacy. The time *is* ripe for Canada, and the sooner the British manufacturer appreciates the great scope of the Canadian field and learns that it is to his advantage to send men of weight—competent, forceful men—to cultivate Canadian trade and study Canadian conditions, the better chance he will stand of obtaining a foothold in this country. The verbal castigation of the "competent authority" is timely.

Progress of Canadian Trade

During the twelve months ended January 31, 1910, the total trade of Canada amounted to $655,546,884, an increase of $102,072,692 over the same period for 1909.. Compared with the twelve months period of 1908, which was the record year for Canadian trade, the increase was $10,188,640.

An analysis of the imports for consumption and total exports separately show that the import trade for the twelve months ended January 31, 1910, was $10,464,625 less than for the same period in 1908, while the export trade showed an increase of $20,653,265.

No other country in the world can present such a remarkable advance in so short a time following so serious a decline as that recorded in the fiscal year ended March 31, 1909.

Accounting Methods for Contractors

It is astonishing how little attention the average contractor pays to bookkeeping. Careful records are generally kept up to a certain point which will show the output of a steam shovel or the work of a gang of men, but they neglect wholly a proper consideration of overhead charges. Not long ago some accounts were submitted to this journal in which no attention whatever had been paid to the heavy interest charges on the capital invested in plant. When a business man invests a sum of money in an enterprise he does not, as a rule, begin to count his profits until he has set aside 4 per cent., at least, as the interest which his money would earn for him if invested in some other way, requiring no attention whatever on his part. A man who puts $100,000 in a big construction plant and fails to charge off 4 per cent. annually for interest on this sum is simply deluding himself as to the profits of his work. Another thing that is often neglected is the interest paid on borrowed money; why this is overlooked is inconceivable, yet the fact remains that it often is. Consequently, when the figures of unit costs are worked up and important overhead items like those mentioned are neglected, people who are ac-guarded with real business methods are unlikely to lose sight of the statements. Several large contracting firms have recognized this necessity and have employed experienced accountants to devise systems of bookkeeping. These extend not only through the office work, but almost into the field, the engineers and [illegible] co-operating with their auditors in endeavors to devise a system which is workable and accurate. Contracting operations have [illegible] that it is absolutely necessary in these days of keen competition and small profits to have some such system. Contractors must rely more and more on bankers for money, and those firms which can submit to the representatives of bankers a set of books and an accounting system which is absolutely clean-cut, stand a far better chance of securing money at a low rate than the men who base their applications solely on their records of past successes.

Concerning Clay Products

That there is activity and aggressiveness among manufacturers of clay products in certain parts of this continent in spite of what some people affirm to the contrary—may be gathered from the following article published in a recent issue of the "Improvement Bulletin."

"The efforts of the Northwestern Clay Association show that organization to be working out a system of operations which is bound to make it of great assistance to the clay industry in its field. The members are looking into the question of giving brick and clay products generally their proper place in the consideration of the public which pays the bills for new construction. The tentative plan for the development of a wider appreciation of the real worth of brick for home building is a suggestion which ought to receive the hearty co-operation of every insurance company which operates within the territory of the organization, as well as the support of every building inspector and every one who is interested in keeping down the fire risk and the cost of fire protection. All over the country arise complaints about the high cost of insurance and the expense of maintaining a fire protection which is admittedly inefficient, but is all that the community can afford. Vigorous roars are let forth because of alleged combination methods which lead to exorbitant insurance charges. And yet an inspection of the costs of insurance reveals that in many respects there is little or no ground for the charge. It is simply assuming a serious hazard, and then complaining because of the cost that it involves. The proposition of the clay association to push the real worth of brick for dwelling construction is one which will naturally lead to better fire protection and lower hazards. Another thing which will work to the ultimate benefit of the brick industry is the matter of formulating a set of standard specifications to which clay brick must conform. This is proposed for the city of Minneapolis, but it should and doubtless will extend and become fairly general. Brick manufacturers know the real worth of their product and do not appreciate the bad effect upon the public mind when it is observed that some brick in a pile will be crushed and broken merely from falling. Yet people who see such incidents will often assume that they are fair samples of the strength of brick, instead of being exceptions. Greater care in excluding poor and faulty brick, from lots to be delivered, will work to the benefit of the business in more ways than one. The Northwestern Association has taken up a good move, and one which can and should be supported by many who are not interested in the brick business."

Face Brick and "The City Beautiful"

By R. M. Combs

If a tailor were to show you a suit of clothes, the front of which was of the finest, up-to-date, attractive material, with the sides and rear elevation made of the fabric used in your underwear, what would you think of him and his shop? You would like to say he was crazy, but his name is "Custom" and he is bigger than you. You think of his age and resolve to reason with him that the entire suit would look best made of the same goods all around. So it is with a building. Buildings look to a man who has ideas for a "City Beautiful" like this suit of clothes, built with a finished front and a common rear and sides.

The average unattached residence or apartment building may require from five to ten thousand face brick and from fifteen to thirty thousand common brick for the other three sides. Stop and see how little more it will cost you to build entirely around with face brick. In the first place you cut common brick out of all exposed wall surface and replace them with the same brick used in the front. These, in many instances, are larger than the common brick, consequently not so many required. The cost of laying in many cases will be the same. If it should be more, the increase per cent. is such a small item in the total cost of the building, that it is hardly discernible.

In the large cities "sky-scrapers" towering above the surrounding buildings, as they are built to-day, look from the rear and sides like grain elevators backed up to be unloaded. With a little study and thought of a "City Beautiful" these giant blank walls could be made to assert the fact that they are office buildings. By using the same brick all around or by using a cheaper brick that would harmonize with the facing material, this effect could be accomplished. This is especially true of Chicago, because, within a radius of one hundred and fifty miles there are being made every day hundreds of thousands of good and beautiful red and brown brick that can be purchased for very little more than the cost of common brick and laid in the wall with no more expense than common brick.

The interest in the creation of a "City Beautiful" has been taken up all over the country by Boards of Trade and every citizen who has a pride in his town. They have spent vast sums of money in plans for parks and boulevards, making choice localities for buildings which the wise man will construct of brick and the wiser man of the same brick on all exposed surfaces.

What are the Brick Manufacturers Doing?

The manufacturers of cement are spending thousands of dollars annually in publishing plans and literature that advocate concrete as the artistic building material and are able to point to many beautiful homes made of the same material all around. These people have so widely advertised their material as an artistic, durable and inexpensive building product, that the Coliseum in Chicago and other large buildings throughout the land are filled to overflowing at their annual shows. Architects and owners swarm there looking for something they can use on all four sides of buildings that will make them look like a whole structure and not like a stall with a curtain let down to serve as the front.

In contrast to our cement friends, what are we brick men doing toward the creation of the "City Beautiful"? We brick manufacturers allow the architect and owner to disfigure our best localities with an abortion that has

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Extracted from paper read at the Annual Meeting of the Clay Manufacturers Association.

one kind of brick for the front and a totally different one for the balance of the building. We do this without a murmur or an effort to correct this deplorable condition.

Are we to let the face brick industry die the natural death that overtook stone as material for fronts? Stone men thought everyone knew what they had and sat back allowing Tom, Dick and Harry to come to them. They had no thought of the "City Beautiful." It shows in the buildings.

Let every brick maker wake up to the fact that by constantly suggesting to a customer the use of face brick all round, we will shortly compel him to see the necessity of making his building look balanced in design. In my opinion this subject is a most important one and I sincerely urge every one of you to wake up to the fact that we have got to show architect and owner how little more it would cost to use the same brick throughout for facing and that by so doing he would have his color scheme complete.

It is for each one of us to push this spirit of a "City Beautiful" from our own standpoint. If we find a man so in love with common brick, suggest his making his front of the same thing. Even this will give harmony in color, and will be an improvement on the arrangement of the suit of clothes to which I have referred.

Low Cost of Paving at the Federal Capital

The report of City Engineer Ker, of Ottawa, Ont., for last year shows that 1909 was a busy year for the department. A feature of the report is the manner in which the cost of pavements and sidewalks has been reduced. The most noticeable reduction was in the cost of asphalt paving, the lowest price being $1.70 per square yard. The reasons given for the reduction are the civic asphalt plant and the fact that on every work the city engineer put in a tender. Where his price was lowest he did the work by day labor. The consequence is that pavements cost a dollar a yard less than before the civic plant entered into competition. The cost of sidewalk construction was also reduced almost [illegible] cent per foot, the reason being the long stretches of walk laid at a time. Only one block of tar macadam was laid during the year. Owing to the short life of this pavement [illegible] repairs required by those already laid, the engineer says this class of pavement has been found more expensive than asphalt. There were laid, in the year, 71 concrete walks with a mileage of 9.54, at a cost of $44,878. This is 16 1-10 cents per foot, as compared with 17 cents the previous year. Only five plank walks were laid, the cost as local improvements being $1,593.17.

New Departmental Building at Ottawa

The accompanying sketch represents the western side of the new departmental building at Ottawa, the contract for which will be let this spring. The building is to provide room for Government branches which are now being accommodated in rented buildings and which are scattered all over Ottawa. The new structure will be located in Major's Hill Park, across the locks of the Rideau Canal from the present group of Parliamentary and departmental buildings. It will be joined to the present Government group of buildings by an ornamental bridge thrown across the Rideau Canal. The new building will be constructed of Nepean sandstone, the material of which the departmental buildings are built. It will have an elevation of six storeys on the side shown and of eight storeys on the opposite, or Sussex street, side; a length of almost 600 feet, or two city blocks, and a width of almost 200 feet. It will contain about 600,000 feet of floor space.

Perspective view of proposed Government Building at Ottawa for which contracts will be awarded this spring

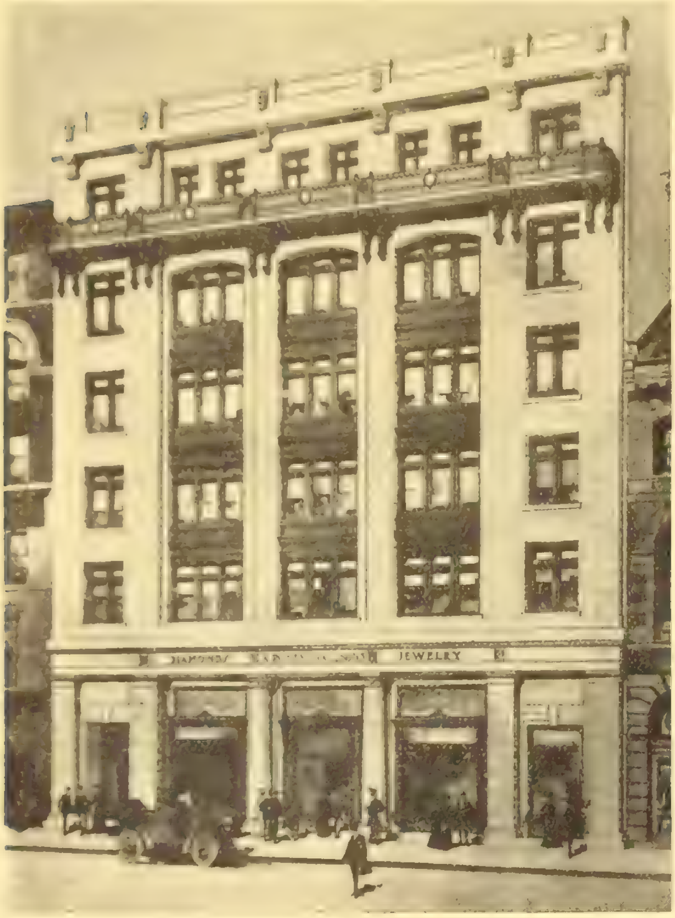
Shortage of Labor in B. C.

Mr. R. Marpole, vice-president of the Esquimalt & Nanaimo Railway Company, of British Columbia, states that 58 miles of construction work will be commenced on the east coast of Vancouver Island as soon as the right-of-way is cleared. The only trouble that is likely to arise, according to Mr. Marpole, is that from a scarcity of labor. Concerning this, Mr. Marpole makes the following remarks:

"There is now apparent a scarcity of labor, which I am afraid will result in retarding construction unless more men are brought into the province to meet requirements in this respect, not only on this railway but on practically all other works and improvements now being carried out in British Columbia."

Proposed Rosenthal Building, Ottawa

The accompanying perspective illustrates a pleasing scheme evolved for Messrs. A. Rosenthal & Sons, Limited, of Ottawa, by Messrs. Weeks & Keefer, architects, also of Ottawa. Messrs. Rosenthal will occupy the basement, first floor and half of the second floor. The remaining part of the building will be devoted to office purposes. The proposition being of a strictly commercial nature and light being available only from the front and rear, it was necessary to have the maximum amount of window area, which could only be obtained by piers and large bays. It was the intention originally to execute the entire front elevation in light Philippsburg marble and the design here shown was prepared with that end in view, but it has since been changed to terra cotta above the second floor, the marble being retained for the ground floor only. The large bays, cornice and window treatment of ground floor will be carried out in cast iron. The scale of the architectural treatment is large with the detail in French renaissance. The ground floor being used entirely for the sale of jewelry, eec. The store proper will have a double row of polished marble columns and all interior finish will be of quartered white oak with silver gray filler and fittings of silver, to harmonize with the stock. The ceiling and walls will be panelled and modelled in plaster, finished in light shades of gray, picked out with silver. Building operations will be commenced about the 1st of May and finished, it is expected, by December 1st.



Design for Building to be erected by Rosenthal & Son, Ottawa.
Architects: Weeks & Keefer, Ottawa, Ont.

Building permits issued at Vancouver, B.C., during the first nine days of April totalled $631,250.

Factory Architecture

It seems a rather strange fact that with all the progressive ideas in designing furniture, mill work, and even machines, that there is apparently very little effort at embodying the elements of beauty with those of utility in factory design, says the "Woodworker." In short, there is practically no effort at the artistic in factory construction. We design factory buildings with peculiar charateristics—the most common one, however, among the larger factories, is long, straight walls. Some of them may be imposing, some of those mammoth institutions with long, high walls, but so is the prison wall imposing and impressive, but the impression it gives it not an inviting one; neither is the impression many a big factory gives. In fact, many of them are decidedly gloomy-looking from the outside, and while there may be something inspiring in their magnitude, there is nothing much that appeals to one in their architecture.

We have made considerable progress in the way of designing for utility. We have the saw-tooth roof to give us more light, but who is there that can discern an element of beauty in a saw-tooth roof? Might we not even have a more artistic roof with prism glass? We have more light and a much better architectural effect. Might we not have diversion from the old straight walls and square corners, and a pleasing variation in the architecture of factories, just as we have it to-day in the architecture of homes? It would not be fair, probably, to argue that we should get this variation even at the sacrifice of utility, but there ought to be practical methods for combining utility and beauty in factory designing, and it is certainly time we give more attention to this.

Machinery people have long since given attention to beauty in design as well as utility, and everywhere, from the engine to the finishing room, we may see some effort of this kind. Also, we may see a brightening up of the interior of a factory by the eliminating of heavy line shafts and the installation of electric transmission, and by the use of paint and whitewash, and various other things suggesting progress, but in all this progress there is, when we come to look at it, very little that has been made in the way of artistic design in factory building. Isn't it time we give more attention to this subject?

City Engineer Ker, of Ottawa, proposes to experiment on the dusty roads of the Federal capital during the coming summer with "Tarvia" instead of oil. The cost of a car tank full of "Tarvia" is only about $800 and one treatment is held to be sufficient for any decent road.

The Quebec & Orleans Island Railway Company have applied to the Provincial Government of Quebec for permission to construct a mono-railway system on the gyroscope principle. The company claims that the one-rail system has been demonstrated satisfactorily. They are prepared to start work in three years and to complete the system in ten years.

Brandon, Man., has an important programme of building construction in hand. Some of the more important items are: office building and warehouse for A. E. Mackenzie & Company; offices and warehouse for the International Harvester Company; C.N.R. hotel; Bullock apartment block; implement warehouse for Beattie & Sons; new Knox, Methodist and Presbyterian churches, and additions for the Brandon Hardware Company.

Practical Data on Building Construction

How to Design Masonry Foundations —Handy Reference Tables Showing Ultimate Compressive Strength of Materials and Practical Working Values

By Paul T. Lesher

Wall footings should be placed directly under or preferably a little outside the centre of the wall, which position tends to slightly tilt the walls inwards, but will be kept in place by the floor beams, etc. (See fig. 1).

The following proportions for the design of pier foundations of masonry and concrete are used in conservative practice.

For the capstone, fig. 2, make "T" at least twice "A."

For the body of the pier use a bater or slope of not more than 1 inch in 2 inches.

For the footing make the offset "D" not more than one-half of "S." "S" is, in good practice, never more than about 16 to 18 inches.

Safe Bearing Values for Foundations

Rock	20	tons per square foot
Gravel	6 to 10	tons per square foot
Sand	6 to 10	tons per square foot
Gravel or sand with clay	4 to 6	tons per square foot
Dry clay	2½	tons per square foot

(One ton equals 2,000 pounds.)

The high values are for the most compact materials. All of the above are assumed to be reasonably free from water, or anything which would occasion a lateral displacement.

A good rule to adopt when designing foundations is as follows:

"That which is below always determines the size of that which is to go above."

Problem—What size foundation is required to support a column that supports a load of 141,000 pounds? Assume the supporting soil to be a stiff dry clay, the body of the foundation is of good Portland cement and cinder concrete, and the capstone of granite. Assume our foundation to weigh 9,000 pounds, which makes our total on soil equal 150,000 pounds.

Solution—Calculation for Size of Base Plate—In the data already given we find that the safe compressive strength of a granite capstone is 700 pounds per square inch. To find the number of square inches required in the base of the column base plate, we will divide 141,000 pounds by 700 pounds, and we get for an answer 202, which is the number of square inches required. We will use a 15-inch by 15-inch base plate, which has an area of 225 square inches.

Calculations for Capstone—From our previous notes we find that the safe working value for the best quality of Portland cement and cinder concrete to be 250 pounds per square inch. To find the number of square inches required in the base of the capstone we will divide 141,000 pounds by 250 pounds, and get an answer of 564, which is the required number of square inches. Will use a 25-inch by 25-inch capstone, 10 inches deep; the depth being made twice the distance "A." (See fig. 2).

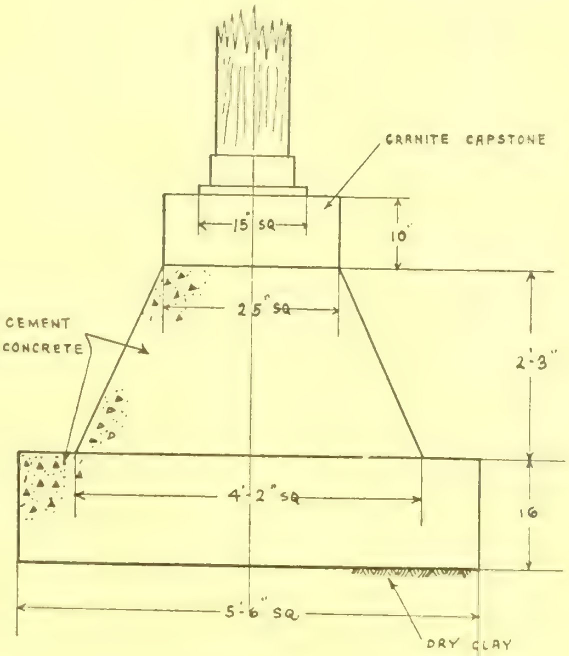


Fig. 3

Calculation for Footing—From our notes we find that dry clay has a bearing value of 2½ tons or 5,000 pounds per square foot, and dividing our load of 150,000 pounds by 5,000 pounds we receive an answer of 30, the number of square feet required in the base of the footing. We will use a footing 5 feet 6 inches by 5 feet 6 inches, and make the depth 16 inches.

Proportioning the Foundation—In the proportions given above it states that "T" should be at least twice "A," and in our case the base plate is 15 inches square and our capstone 25 inches square; therefore 25 inches minus 15 inches equals 10 inches difference or 5 inches on a side. Therefore 5 inches equals "A" and 2 times 5 inches equals 10 inches or "T."

For the footing make the offset "D" not more than one-half "S," and as "S" in our case equals 16 inches, "D" will equal one-half of 16 inches, or 8 inches.

Calculation for Height of Body of Pier—The batter of

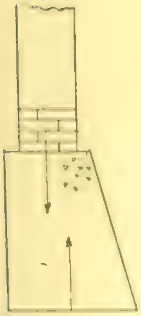


Fig. 1

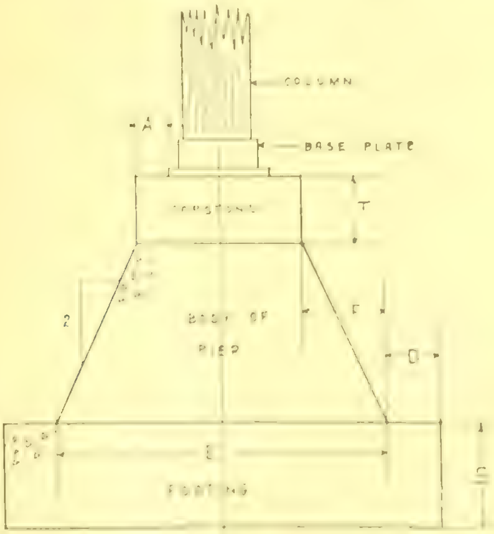


Fig. 2

the body of the pier should be in a proportion of 1 to 2, as shown in fig. 2.

In our case the capstone is 35 inches square and the distance "T" (fig. 3) is 60 inches. Now 60 inches minus 35 inches equals 25 inches, and this divided by 2 gives 12½ inches, which is distance "H." The depth being in a proportion of 1 to 2 must therefore be 2 times 12½ inches, or equal to 25 inches; say we make the depth 2 feet 3 inches.

A detail drawing of the foundation is shown in fig. 3.

Ultimate Compressive Strength of Materials

	Lbs per Sq. in.
White pine, parallel to the grain	3,000
Hemlock, parallel to the grain	2,000
Spruce, parallel to the grain	3,000
Yellow pine, parallel to the grain	1,400
Oak, parallel to the grain	3,600
Wrought iron	11,000
Structural steel	61,000
Cast iron	81,000

Use a factor of safety of four for timber, wrought iron and steel, and a factor of safety of six for cast iron.

The following are average working values conforming to the best practice. These are given in place of the ultimate values, because the ultimate values in these cases have a very wide range, dependent upon special conditions and workmanship.

Compression—Practical Working Values

	Lbs. per Sq. in.
Brickwork in lime mortar	100
Brickwork in gauged mortar	150
Brickwork in Portland cement mortar	200
First-class granite masonry	350
First-class marble or limestone masonry	250
First-class sandstone masonry	175
Granite capstones	700
Marble or limestone capstones	500
Sandstone capstones	350
Portland cement and stone concrete in reinforced concrete construction and in foundations	500
Best quality of Portland cement and cinder concrete in reinforced concrete construction	250
Rubble masonry in cement mortar	150
Rubble masonry in lime mortar	80

For the preceding values of masonry the height of a wall should not be more than sixteen times the least unsupported thickness of the wall, or the wall may fail by buckling or bending.

The height of a detached or free standing pier should not exceed ten times its least side.

British Building Trades

Building and woodworking trades in Great Britain are dealt with in the latest report of the Imperial Board of Trade giving the results of an exhaustive inquiry into the earnings and hours of labor of the workers in various industries. The report deals with the year 1908. For all workers in the building trade the average net earnings per head in an ordinary week in the summer of 1908 were found to be 28s. 6d. The average for men was 31s. 6d., and for improvers and apprentices of all ages, and lads and boys under 20 years of age, it was 10s. 3d. Excluding the large proportion who worked either less than or more than the ordinary hours, the average full-time earnings were 28s. 1d.—the men averaging 33s., the improvers, lads, etc. 9s. 7d. The average full time earnings of the principal classes of skilled men (such as bricklayers, masons, carpenters and joiners, plumbers, plasterers, and painters) were 36s. 4d., and of laborers were 24s. 5d. Since the last general inquiry by the Board of Trade (which concerned the year 1886), the average wage of workpeople in the building trade have risen by about 18 per cent. Dealing with the full-time workers in an ordinary week the report gives the average earnings of the men in the different trades thus: Building, 33s.; cabinet making, 33s.; harbor construction, 31s. 10d.; sawmilling, 27s. 4d.

The average earnings of full-time men in the building trade during an ordinary summer week varied greatly. At the head were: London, 38s. 8d.; Scotland, 33s. 9d.; Northern Counties, 33s. 6d.; Yorkshire, 33s. 1d. Ireland was the lowest district, with 27s. 9d. for its average.

Carpenters and joiners formed 17.2 per cent. of all the men in the building trade returns. The list of the average earnings, working full time in an ordinary summer week, were headed by the Metropolis: London, 43s. 9d.; Yorkshire, 36s. 11d.; Northern Counties, 36s. 8d. The average full-time wages for the principal classes in London in the summer were: Plasterers, 45s. 4d.; bricklayers, 44s. 5d.; carpenters, 43s. 9d.; masons, 43s. 3d. Scotland, with an average of 37s. 7d. in a full ordinary week in summer, exceeded London (with 36s. 10d.) in the average wages paid to painters and decorators. In the construction of harbors, docks, roads, sewers, etc., the average earnings of all men in an ordinary week in the summer of 1906 were 27s. The average for a full-time worker was 31s. 10d. For lads and boys the corresponding averages were 13s. 1d. and 13s. 6d.

Interlocking Steel and Concrete Pile Construction for Sea Walls and Foundation Work

A new system of interlocking pile construction has been used recently in Chicago for protective work and jetties on the lake shore and for the foundations of buildings. The construction is such that the completed work forms a solid and continuous wall. The process consists in sinking steel tubes by jettng and loading, and then filling them with concrete. Each tube or cylinder has on one side a hollow vertical rib and on the other side a hollow vertical socket, both of dovetail form; the rib of one pile enters the groove of the other and the piles are thus locked together. As the rib and groove are hollow and form a part of the tube, the separate concrete piles in the tubes are locked together also, and do not depend upon the steel shell to lock the piles together. For land work, the cylinders are open at the bottom, and the faces of the rib and groove are open (the sides being tied together by transverse strips. With this arrangement the concrete filling forms a monolithic mass (above the surface of the ground), and may have horizontal and diagonal reinforcing rods embedded within it. This arrangement is used also in water where there is no danger of scouring. In this case, the tube does not displace the material, and the concrete filling does not extend below the bottom of the lake or river. For work in the water, and exposed to the action of waves and currents, the tube has a closed flat bottom and closed faces to the rib and groove, so that the concrete filling forms a separate pile, interlocking with the adjacent piles, and reinforced by vertical rods as may be required.

"A year of constant prosperity has been enjoyed, and the prospects are unusually bright," said City Treasurer Coady, of Toronto, in his annual budget, issued in connection with the estimates for 1910. The growth of Toronto is indicated in the estimates. The expenditures this year will total $6,868,755, as against $6,081,532 in 1909, or an increase this year of $787,223. The estimated revenues are placed at the same figure.

To diminish the noise of elevated trains in New York City concrete is to be tried. A solid floor of this material 11 to 15 inches thick will be laid on the steel structure to serve as a base for the ties, ballast and rails.

The Science of Management Engineering

Fundamental Principles of Handling Work Successfully Stimulating Effect of Bonus System Problem of Finding Satisfactory Unit for Measuring Labor

By H. P. Gillette

As I conceive it, the fundamental law of successful management is this: To secure maximum output make all payments for work proportionate to work done.

This may be termed "the law of reward increasing with increased performance." This law is so self-evidently true that some will be surprised to see it dignified by the name of law. Others, if in a carping mood, may say that I am striking matches to find the sun. However, it is not the novelty of a scientific law that gives it value. When formulated definitely, many laws of science are self-evident. They are not the less valuable for being thus self-evident. That laws of this kind should be formulated is highly desirable, because, until they are definitely stated, most men fail to apply them.

It is one of the traits of human nature to have no respect for unformulated laws, and none too much for those that are formulated.

The average employer will grant instantly that workmen should be paid in proportion to performance, but does the average employer so pay his workmen? Does the man who shovels 18 cubic yards daily into a wagon receive 20 per cent. more pay than the man who shovels 15 cubic yards? Does the foreman who erects a bridge in 15 days get any greater salary than the foreman who spends 20 days with a gang of the same size on a bridge of the same dimensions?

While the ordinary wage system of payment is crudely based upon the "law of proportionate reward," I think few will attempt to maintain that it represents a logical application of that law. Certainly the grouping of common laborers into a general class whose wages are, say, $1.50 per day, is far from being an application of the fundamental law of management, for among these laborers are men varying widely in ability and inclination to work.

When thus confronted with a self-evident failure to apply this "self-evident" law of management, the average manager will find you forty excuses for failing to follow it. "It is impossible to vary wage without producing dissatisfaction." "Labor unions will not stand for it." "I know that men differ in output and in ability, but I have to work them in gangs and I can't pick out one from another." "You have to take the lean with the fat." "Theories are all right, but there are practical limits to their application." "I get more out of my men than my competitors do out of theirs." These and many other excuses leap to the lips in defence of the pernicious wage system. But I am forced to regard every such excuse as an afterthought, for there is scarcely one of them that does not give you its own answer the minute it is announced.

Causes of Dissatisfaction Among Workmen

Dissatisfaction among workmen is either the result of unfair treatment or the evidence of an unsound mind. The normal man is never dissatisfied when given a chance and an incentive to earn more money. It may be that a man has unthinkingly followed the mandates of a labor union and is opposed to a piece rate or bonus system on "general principles." He may tell you that theoretically it is admirable, but that experience has shown that employers invariably cut the rate. If this is the attitude—and note it keenly—the dissatisfaction of the workmen is not with the operating of our fundamental law of management, but with the failure of employers to obey that law. The workman objects not to pay proportionate to performance, but to the cuts in the price rate or bonus which short sighted and hoggish employers have so often made.

When a manager excuses his failure to follow the fundamental law of proportionate reward by saying that he must work his men in gangs and that he cannot distinguish the relative performance of individuals, there is more reason for considering his excuse; but, even then, I regard it as an excuse badly in need of crutches. Because men must be worked in gangs on certain classes of work, does it follow that one must mingle good, bad and indifferent workmen together in the same gang? Not a bit of it. Every employer who is really keen tries to weed out the poorer workmen, if men are abundant, and secure gangs of more than average ability. But how often do these same employers then proceed to pay more than average wages? By not doing so they show their complete blindness to this fundamental law of management which they will tell you is so self-evident.

The man who starts with a determination to apply the law proceeds along different lines entirely. He first puts his wits to work to devise ways of doing away with gang work entirely, or at least of reducing the number of men in each gang. Thus, if a gang of men is engaged in shovelling earth into wagons, the manager is generally able to supply extra wagons and to split up the large shovelling gangs into small groups of, say, two men to each wagon. Since extra wagons are provided, no lost time occurs while loading them, and it is a matter of no consequence whether a wagon is loaded by two men in twenty minutes or by six men in seven minutes. The aim is to reduce the large gang to smaller gangs, and to put the best workmen together, so that they can be paid according to their performance. Still further to arouse individual ambition, it is often wise to put a dividing board across the wagon box, assigning one-half of the wagon to one shoveller and the other half to his mate.

Advantages of Grouping Men in Gangs

As a corollary of the fundamental law of proportionate rewards, we have this:

Group men in gangs according to their respective energies, and so plan the work as to make each gang as small as is consistent with efficient work. Then pay these gangs according to the number of units of work done by each.

There are many classes of work that do not admit of working men in small gangs, to say nothing of working as individuals, but the scientific manager will still persist in his effort to group men according to their energy. If laborers are scarce, he will not discharge the poorer ones, but will group the poorer workers together, and pay them less than the other groups of greater ability. But if laborers are plentiful, he will speedily weed out the poorer workmen, keeping only those who earn large incomes by virtue of their large output.

In any event, even where large gangs must be worked, payment of men should be based upon performance. Taking steam shovel work for example, how often does one see anything given to the men except the standard wages. Yet every man of the various gangs, from the pitmen to the men dumping the cars, is a factor in the total yardage moved. Once the character and condition of the work are fairly well known, a scientific manager will establish a bonus on every yard in excess of a stipulated minimum, and this bonus will be distributed among all the men pro rated according to

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* Read before the American Society of Engineering Contractors.

daily wages. A special bonus should be given to the foreman that job [illegible] upon him [illegible] the display not merely of energy but of foresight. His reward should, therefore, be exceptionally large if exceptional output is secured.

When several different gangs of men are dependent upon one another in securing a result, the problem of providing a reward proportionate to performance is obviously complicated. Take macadam road building, for example. There we have a gang of quarrymen, another gang delivering rock to the crusher, a gang at the crusher, a gang hauling, and a gang spreading, sprinkling and rolling the stone. If the gang at the crusher is slow, an output of only 50 cubic yards per day may result. Then the teams hauling the stone are unable to perform a satisfactory ton-mileage of work, and the gang spreading and rolling is unable to do a good day's work. How can a manager pay bonuses to these separate gangs in a manner satisfactory to each. The square yard of macadam may be the unit in which the contractor receives his pay, hence his tendency will be to establish a bonus based upon the number of square yards laid daily. However, to do so is an error. The rock drillers should receive their bonus upon the number of lineal feet of hole drilled. The men who handle the rock should receive their bonus upon the yardage of loose rock crushed. The teamsters should be paid a bonus upon the ton-miles, or yard-miles. The spreading gang should receive their bonus upon the cubic yards spread. The roller engineman should receive his bonus upon the number of miles his roller travels daily. In each case, the effort should be made to select for each gang a unit of work that most closely corresponds to the theoretical unit of mechanical work, namely, resistance multiplied by distance. In rock drilling this unit is the lineal foot of drill hole. In hauling, it is the ton-mile. In rolling it is the roller-mile.

The result of all these various units of work is the square yard of macadam, but the square yard of macadam is not the proper unit for measuring the work done by any single gang, excepting, perhaps, the gang engaged in spreading.

The work of a steam roller is commonly reported in terms of the number of square yards of macadam compacted daily. Nevertheless, this is a very unfair unit. On a compact gravel subgrade, a steam roller is capable of daily consolidating several times as many square yards of macadam as on a sandy subgrade. Double the amount of water used to puddle the screenings and the roller will greatly increase the yardage consolidated. In brief, the roller engineman has many more trips to make over a given length of road where the subsoil is soft, and where water is meagrely supplied. His work is more truly measured in the miles he travels than in the area he consolidates daily.

If the average manager of macadam roadwork realized this fact, we should see several decided changes in current practice. First, the 10-ton roller would speedily give way to the 15-ton roller having proportionately wider tires, and the same weight per lineal inch of tire, for one mile travelled by such a 15-ton roller is the equivalent of 1½ miles travelled by a 10-ton roller. Second, the engineman would use the high speed instead of the low speed, and compact a correspondingly larger area per day. Third, the water tank on the roller would always be made large enough to enable the roller to run five hours continuously, even when working on steep grades. Fourth, the engineman would see to it that no stops to take on water would occur except at the noon hour and at night. Fifth, the engineman would have his roller steamed up the moment that the working day began. Sixth, the engineman's every effort would be directed toward making a big mileage, and he would be quick to complain of poor coal or of anything that in the slightest degree reduced his mileage.

Result? Twice as many trips over the macadam as needed? Precisely—and then what? Twice as much broken stone delivered daily to be consolidated by the roller. The first result of paying an engineman a bonus upon the mileage covered (using an odometer to measure mileage) is to stimulate him to an over-production of mileage, which he should be paid for just the same as if it were needed. The next step is to utilize that mileage by increasing the amount of stone delivered daily.

Stimulating Effect of Bonus System

Now, it may be said, all this could be accomplished in other ways. How? Who has accomplished it otherwise. There is no stimulus comparable to the stimulus of paying men in terms of the best theoretical unit of work. The mile for the roller, the lineal foot of hole for the rock drill are units of this sort.

Now let us go a step farther. If a man is ready to work but has nothing to work with, what shall be done? Is it sufficient merely to pay him an hourly wage while he lies idle, and let him lose his possible bonus? I think not. I favor paying him for every hour of idle time on the basis of the total earnings he averages per hour when actually working. At first this seems like an undue penalty upon the contractor for delays due to accidents. But I believe the penalty for breakdowns and delays should be severe. Then those who are responsible for the accidents and delays will receive the punishment they deserve—the punishment that will quicken them to scheming how to escape it in future. I have found it a good plan to dock the wages of the engineman on a crusher a dollar for every hour lost through shutdowns in excess of three hours per week, and to give a bonus of a dollar an hour for all time saved from the three-hour standard of loss. An engineman who had been losing nearly an hour a day for one reason or another, woke up when he was informed that this rule was about to go into effect. He had come to regard short stoppages as being a matter of course, until it also became a matter of course that he should settle for such delays out of his own pocket, at least in part. I recall that one of the sprocket chains on the bucket elevator had been in the habit of breaking almost once a day. The engineman, who was an intelligent fellow, had blamed it upon poor material in the chain, too light a chain, and what not. But now he began to think. Thinking, he concluded to experiment a little. Perhaps the chain was too tight, and when a bit of stone flew out and caught between the chain and the sprocket wheel, there was not enough slack in the chain; so, perhaps, that was why it broke occasionally. The surmise was perfectly correct. Why some of us, who also had intelligence, had not thought out the reason for the breakages of the chain, I do not know, unless it is that we had many another thing to think about. By giving the engineman one thing to think about, and a very strong incentive for hard thinking, the trouble was speedily located.

Using a somewhat long story to illustrate a conclusion, I thus come to another corollary of the fundamental law of management:

Pay men for lost time not upon the basis of the hourly wage but upon the total hourly earnings (including the average bonus), and place a heavy penalty for lost time upon the man who is responsible for it, at the same time giving him a bonus for reducing lost time below a stated standard.

Sometimes the responsible individual is an engineman, sometimes a foreman. Sometimes a whole gang should be made responsible.

If men are to be paid a bonus for excellent performance, it is but logical that they should incur a penalty for carelessness, and even for lack of quick-wittedness. In the operation of machines there always will be some lost time, but there now is vastly more than there should be, and the real reason is to be found in the absence of sufficient incentive to reduce the delays.

Difficulty in Finding a Unit of Measurement

I have indicated, in a general way, how the units should be selected for measuring the performance of each class or gang of workmen. A paper of very considerable size could be written on that subject alone. As the very foundation of successful management is the unit used in paying for work done. Indeed, to my way of thinking, nothing stands so in the way of an almost universal adoption of the bonus system as the difficulty of finding satisfactory units which can be readily applied in measuring the day's work.

Measuring drafting is even more difficult. Yet I am so sanguine that some suitable unit can be devised for each kind of work that I would never despair. Once I suggested that in measuring a certain class of drafting, a good unit would be the lineal inch of line drawn. It was objected, and very properly, that to measure up the number of inches would be itself no small task, to say nothing of the difficulty of telling where the morning's work had begun. The answer was that the india ink could be kept in a graduated glass, and measured daily. Since the lines were of equal thickness, the amount of ink was a function of the number of inches of lines drawn. Dishonesty could, of course, make the application of this method difficult, but occasionally checking up by actual measurement would discourage any attempts at dishonest use of the ink for other purposes.

At times I feel like saying that any man who can devise a satisfactory unit for measuring certain kinds of work is assured of a fortune, if he will but adopt that unit and hire men to work under it on the bonus system of payment. However, when I look about me and see the numberless jobs of a class where the units of work are readily measured by any intelligent man, and yet where the bonus system is not applied, I incline to the belief that genius is less needed for devising units of measurement than is common sense in using those we have. To me nothing is more amazing than that managers of contract work persist in using the unscientific wage system of payment after it has been demonstrated again and again that men will increase their output 50 to 100 per cent., and often much more, under a bonus system. Here are Klondikes under our very noses, yet we dream of Alaskan gold four thousand miles away, buried deep in frozen gravel and only to be upturned by prodigious labor yoked to preposterous luck.

If I were to show you a diamond and say: "A man with a wallet full of Kohinoors showed me where I could find diamonds, too—took me to the very spot where I picked up this one, and I am going back after more. Will you join me?"

Would I have company on the return trip? That is precisely what I have been telling you. I can not make the statement too strong that wealth awaits every independent manager of ordinary ability, provided he will grasp the fundamental law of management and apply it. Yet, in his search for wealth, he must use the greatest care not to become hoggish. He must make it a cardinal principle to let his workmen secure most of the product of their increased efforts resulting from paying them according to the bonus system, preserving only a liberal percentage for himself. Acting in this manner, the independent manager can speedily build up an industrial "clan" of workmen who will be as loyal to him as were the old Scottish clansmen to their chief. Men never begrudge a leader a generous share of the spoils of war or the profits of peaceful industry—provided the leader has been generous in his division of the gains among the men of the ranks. Lack of generosity—yes, and even of common fairness—has brought the old piece rate system into such disrepute that it has long been regarded by trades unions as akin to slavery. It now devolves upon managers to show some heart in applying the bonus or piece rate system. If they do, they will demonstrate that well-planned generosity is the greatest getter of wealth.

During the past week the Canadian Pacific Railway Company have engaged a large number of workmen who will be engaged in Western construction work.

English Expert Advocates the Use of Rough Masonry

Mr. M. H. Baillie Scott delivered an interesting lecture on "The Art of Building" in London, recently. With regard to some of the materials of building, Mr. Scott said: We have in many districts stone of various kinds for building, and in most of these districts we have object lessons in old buildings, showing how stone may be beautifully used. It is unfortunate, however, that the modern mason seems quite unable to profit by such examples. He always wants to improve on them. The art of masonry may often be made a kind of rude mosaic, in which stones of various shapes and sizes and tints can be combined and arranged. In old cottages in Surrey you may find the irregular spaces between the stones adorned with scraps of flint, iron, stone and broken red pottery, with excellent effect. Another instance of the same mosaic in masonry may be found in the old castle at Peel, in the Isle of Man, where the wide scale of tints in the local stone from various shades of red to gray and yellow is taken full advantage of. Is it necessary to add that in the local modern buildings of the same stone the material has been reduced to an absolute regularity of tint and surface? When the modern mason does descend to rough walling he lets us know it, and can only give us an exaggerated excrescence in the centre of each stone—a confection known as rock-faced. And he seldom knows how to deal with the mortar joint, which in good old work makes such a beautiful reticulated pattern of varying shades of gray.

If only, instead of ignoring the qualities of materials and forcing them into these meaningless forms, we were to begin at the other end, what a new world of art would be disclosed to us. A visit to the site of our building may disclose, perhaps, the fact that flints are the essential local materials for walling. What a palette is there for the artist, of tones of pearly gray; what a variety of textures can be obtained, too. Here the soft rounded outlines of the uncut stones, and here, to mark some special feature, the cut flints. The surfaces of the walling enriched, perhaps, with the shivers of the broken flints set in the joints, or notes of red brick or brown stone. And all this you won't find anything about in books, or learn anything about in offices, or art schools. It is a kind of rude natural mosaic, and if rightly done implies the use of materials in the right way, inasmuch as it develops to the utmost their possibilities, instead of obliterating their character by forcing them into preconceived academic formulas. It seems that we are too apt to put the cart before the horse in these matters, and instead of letting the materials influence us and suggest the design, we let them have no voice in the matter at all, but simply shape them into the arbitrary forms we have learnt at school.

Slates have the defect that they do not readily yield to nature's inimitable coloring. The rougher and thicker they are, the better the artist in building will like them; and except in their own special locality he will perhaps prefer a good gray tone to the more fashionable green. There is a kind of harshness about slates which makes them specially at home in bleak and barren uplands, or in wind swept open spaces by the sea, while the kindly warmth of tiles makes them more adapted in wooded and sheltered places.

C. P. R. to Spend Millions

The biggest individual contract ever given out by the C.P.R. will be awarded on May 1st, when tenders will be opened for the excavation of 25,000,000 cubic yards of earth from the canals and ditches to be constructed on the central division of the company's irrigation area. The work will extend over a period of five years and its cost will run into millions of dollars. The C.P.R. will spend [illegible] on irrigation work this year.

Bituminous Pavements on Macadam Base

Maintenance and Cost of Macadam Roads Resurfacing with other Material Practical Directions for Obtaining the Most Satisfactory Results*

By L. White, Engineer, South Park Commissioners, Chicago.

Macadam, for the purposes of this discussion, may be broadly defined as covering all kinds of broken stone road surfaces bonded with more or less finely divided mineral matter, which may or may not be of the same material as that of which the body of the macadam is made up. Road surfaces made up of slag, chert or gravel which does not depend on a soluble clay as a binder, may be considered in this class, where hydraulic cement or bitumen is used as a binder, the resulting composition is not macadam.

It seems unnecessary to state that macadam thus defined is one of the oldest and most universally used forms of improved road surfaces, and that in many towns and suburban districts it is almost the only road material used. In our cities, too, it constitutes a large percentage of the street pavements, and is easily among the most valuable assets of almost any community.

The city of Chicago, for instance, has 600 miles of macadam, which is about 50 per cent. of all the usable street pavement in the city, and may be conservatively valued at $17,000 per mile, or a total of $10,000,000. All other street pavements in Chicago may be valued at $20,000,000. Thus 50 per cent. of the area and fully 33⅓ per cent. of the value of all pavements in the city is macadam. These figures of value do not, of course, include the value of the land on which the pavements are built, nor do they include the value of any grading, curbing or drainage.

Little Rock has 14.63 miles of macadam, costing $290,000, and 14.39 miles of all other kinds of street paving, costing $580,000, the percentage of area and value being about the same as in Chicago, that is, about half the area of street pavements in the city is macadam, the value of which is about one-third of the total. I use these figures to emphasize the quantity of macadam in use and its money value.

Care of Macadam Surfaces

If macadam could be maintained at a reasonable cost in good surface without dust, it would be a very satisfactory pavement for many situations. Its tractive resistance is low when in good surface; it affords secure foothold for horses and motor cars; it is not noisy as some other pavements, and its appearance is generally harmonious with the surroundings on a residence street, a park drive, or a suburban highway.

The cost of maintaining macadam will not be discussed at any length in this paper, as it is a large subject in itself, and would require the collection of a great deal of data. Local conditions, too, are very variable and each engineer or road superintendent should work out this phase of the subject for himself. Suffice it to say, that very few macadam roads in this country are maintained at all. They are generally built and left to wear out.

When the cost of maintenance passes a certain amount, the macadam should be replaced with other road surfacing material. There may be conditions where the volume of traffic is so great the question of maintenance goes beyond a mere question of cost—it becomes an impossibility. I will allude to one case of this sort that occurred on one of our Chicago boulevards. A portion of this boulevard was reconstructed in 1905 and paved with 12 inches of macadam with a granite top at a cost of $1.25 per square yard. During the year following its construction, fully 10 per cent. of its original cost (or 12.5 cents per square yard) was spent in its maintenance, besides the regular charges for cleaning and sprinkling. In its second season it had deteriorated so much that the attempt to maintain it as a macadam road was abandoned, and a contract was let for a permanent bituminous pavement. It would be reasonable to estimate it would have cost 25 cents per square yard or 20 per cent. of its original cost to have put it back in its original condition and maintained it during the year.

During this period the traffic on it was about 3,000 vehicles per day. A census was taken in 1909, after the permanent pavement was laid, and found to be about 5,000 vehicles per day. Probably this increased traffic was due in part to its better condition with a better pavement.

If a dust-laying preparation is used, it must supply enough binding material to hold the stone together. If the stone is effectively bonded together, no dust is formed except the limited amount formed by attrition from the particles of stone itself.

Dust-layers are various, from water, with or without the addition of hygroscopic chemicals, to oil and water emulsions and crude or prepared oils, tars, etc. All of these have their value in preserving the road, as various experiences show, but will not be further discussed as this paper is addressed principally to the problem of utilizing macadam as the base for permanent bituminous pavements.

Observations as to Cost

In the beginning of this paper I gave two typical examples of cities with macadam pavement amounting to 50 per cent. of their respective total areas of paved streets. In each case the original average cost was approximately $1 per square yard. By the time the determination is reached to resurface the macadam streets with some other paving material, the macadam would probably require a complete resurfacing with, say, four inches of new stone to restore them to approximately their original condition. Four inches of new macadam stone, well rolled and finished, would cost about 40 cents per square yard, leaving the present value of the old macadam without this resurfacing 60 cents per square yard. The old macadam will be thoroughly compacted under the traffic, but full of ruts and holes and with a considerable accumulation of dirt over the surface. There will, perhaps, be at least 75 per cent. of the original amount of stone still on the street. The cost of cleaning off the accumulation of dirt, spiking up and redressing the surface, and covering it with a sprinkling of new stone (not exceeding one inch in thickness) will cost about 15 cents or, say 20 cents as an outside figure.

An extended experience of the writer in this sort of work indicates that 17½ cents is a safe average figure. In this condition, the road surface is comparatively solid and unyielding, but not in a condition to carry any considerable traffic without some sort of paving surface over it. A 5-inch concrete layer would cost about 50 cents per square yard, and to remove the macadam and prepare for the concrete, 15 cents per square yard. The concrete would probably have some more stability and be safer to use than the macadam if it was intended to lay a brick or block pavement, or a sheet pavement of a kind that depended on the base for stability against shifting. The use of the concrete, however, would mean throwing away macadam worth 60 cents, and an additional expenditure of 75 cents per square yard. The obvious thing to do would be to use a paving material adapted to utilize the existing macadam base, and one that can be varied in construction somewhat, according to the needs of the traffic.

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*Read before the American Society of Municipal Improvements.

As stated, a brick or block pavement would not be an ideal one to use, as each individual block must in a measure find its own bed and carry practically all the weight imposed on it. Brick, creosoted block or granite, besides having other objections for use on such roadways as we are discussing, would not be flexible in cost to meet varying conditions of traffic. A standard construction with standard size blocks would have to be adopted, which would probably be suited to an entirely different traffic from that under consideration. The obvious thing to do would be to choose some form of sheet pavement, preferably a bituminous composition, that would assist in bonding and binding the macadam in place, adjust itself to slight inequalities of support and be more or less variable in thickness (and consequently variable in cost) according to the needs of the traffic.

The more common form of sheet asphalt pavements answers these requirements to some extent, but the objections to it are as follows:

It must be made comparatively thick, say three inches, to conform to accepted standards; its cost is dependent on its thickness but not in direct ratio thereto, it is more or less dependent on the base for its stability and consequently not safe to use on such a base as we are describing; it has a smooth sheet-like surface more or less slippery, and not desirable in appearance for boulevards and driveways with rural surroundings.

The ideal pavement for such conditions would be a bituminous composition with crushed stone as the principal mineral ingredient. The stone in the body and surface of the pavement would bond well into the macadam, afford a good foothold and present a desirable grainy surface to the eye similar to well-built macadam. The size of the stone should be regulated by the amount of traffic to be expected. The bitumen should be soft enough at all seasons to make an elastic and noiseless pavement, and yet of sufficient stability and constancy under extremes of temperature to hold the mineral aggregate firmly in place. If the bitumen becomes very soft under the summer heat it may act as a lubricant between the particles of stone instead of a stable binder.

Practical Directions for Obtaining most Satisfactory Results

To accomplish the best results by this method, there should be a layer of clean coarse stone spread on top of the macadam base described above, and lightly rolled just enough to level the stone off and set it in position. The size of the stone should be from ½ to 2 inches, depending on the thickness of the layer of stone it is desired to bond with the bitumen. Generally this layer should not be less than 2 inches thick, as the bitumen should penetrate to that depth to make a safe stable road surface under average conditions of traffic.

After lightly rolling, the hot bitumen should be poured on until the voids in the stone are all evenly filled. Over the surface then spread a layer of screenings and fine crushed stone, none of which should exceed ½-inch in size. It is then thoroughly rolled until the fine material is forced into the interstices of the large stones, completely filling them, with a thin layer of fine stone left on the surface.

If, during the rolling process any of the bitumen is forced through to the surface, more screenings should be spread until the whole surface is well covered. In some cases a second light coat of bitumen is poured over the surface with a second dressing of stone chips or screenings. This, however, should not be done with any but the lighter bitumen, either tar or oil. Anything heavy enough to be termed asphalt and to produce a safe and stable binder will not penetrate through the layer of fine stone or screenings and consequently will lie on the surface as a thin coating not bonded to the rest of the pavement.

The best results may be expected from the use of the coarser stone and heavier binder, so long as it is not of a quality that will be hard and brittle in cold weather. For this reason, a comparatively heavier grade of asphalt may be used than of tar. The quantity of bitumen, either tar or asphalt, used in poured macadam should be from two or three gallons per square yard. Of the lighter grades of bitumen the less quantity should be used, otherwise a shifting, rutting surface will be gotten.

The drawbacks to the use of poured macadam are the irregular and somewhat uncertain results obtained, and the limited season in which the work can be done. Weather conditions must be just right, neither cold nor damp, and the stone must be clean and free from dust. Old macadam cannot be poured. The stone must be fresh and clean. The greatest obstacles to successful work in poured macadam may be set down as moisture and dust.

We come now to another form of bituminous composition, specially adapted to use on macadam base, which may most properly be termed bituminous concrete. This includes the bitulithic or tar concrete, and the asphaltic concrete. This kind of pavement is mixed like concrete and laid hot. The tar concrete, when well laid, makes a pavement of great strength and good qualities, when the temperature is just right. Tar, however, is much more susceptible to the influences of heat and cold than asphalt and is hence a more dangerous material to use.

A bituminous concrete should be laid hot and freshly mixed for the same reason that a sheet asphalt or sand asphalt pavement should be laid hot. There is, however, an additional reason why the tar or asphaltic concrete should be handled as quickly as possible. If it is hauled long distances while the bitumen is in a liquid or semi-liquid state, it is liable to settle down to the bottom of the load and become partially separated from the coarse aggregate. In the case of the sand asphalt paving mixture, the finer aggregate serves to hold the melted bitumen better.

Use of Portable Asphalt Mixing Machines

In the South Park system of Chicago there were laid during the season of 1909 about 150,000 square yards of this asphaltic concrete pavement on a macadam base, such as I have attempted to describe. All of it has been mixed in two portable asphalt mixing machines, which were designed and built especially for the commissioners. These machines are complete plants in themselves, drying and combining the stone and sand, heating the asphalt, automatically proportioning the materials, and delivering the paving composition ready mixed for laying. The machines are moved along the street, about 300 feet at a time, similar to portable concrete mixers. They are strictly portable, requiring only about 8 to 10 minutes from the time operations are stopped in one place until the machine is set in its new position and started again.

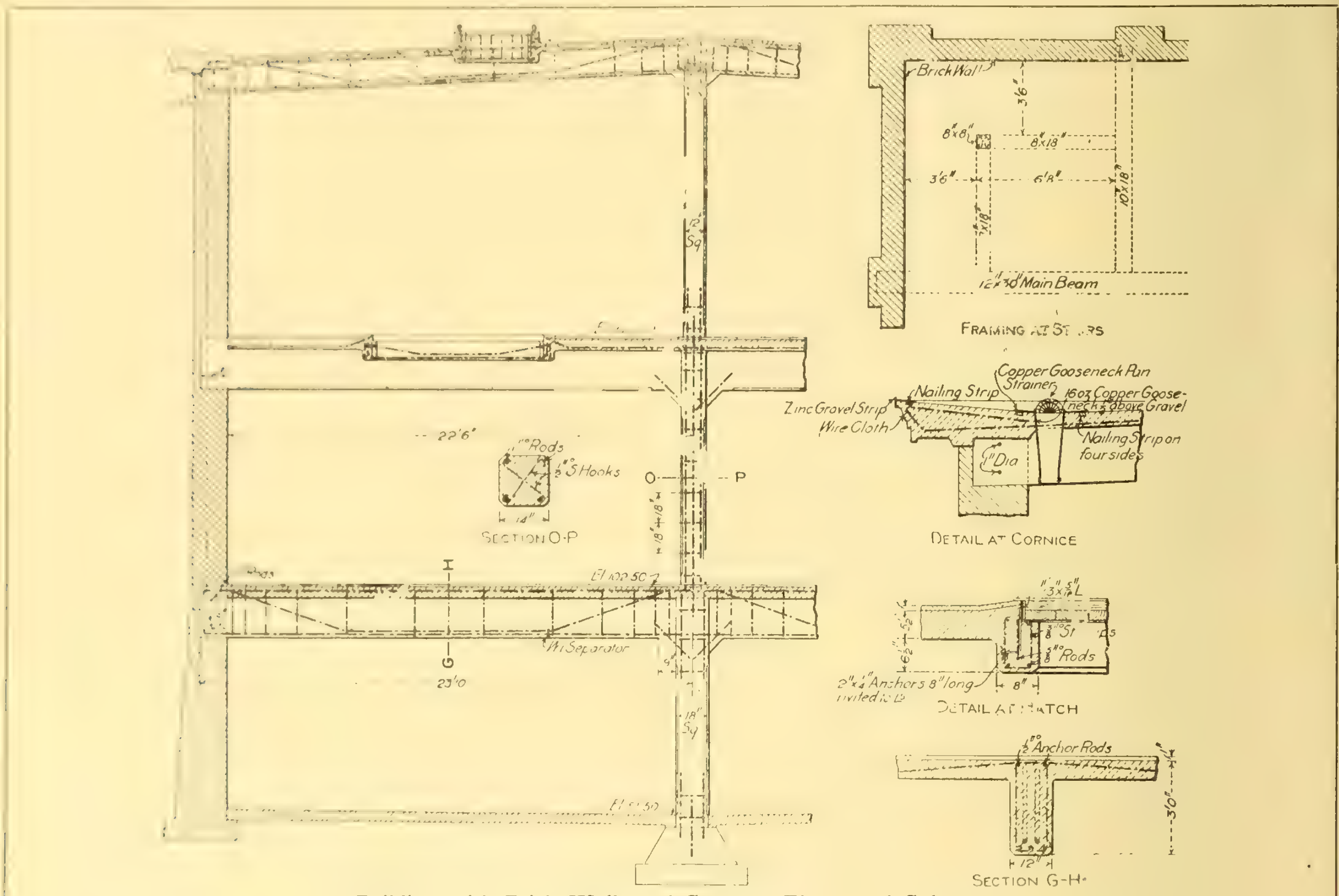
The average capacity of one of these machines under reasonably favorable conditions, is 1,000 square yards of pavement two inches thick per day, though as much as 1,250 square yards per machine has been laid in 9 hours. With this sort of a machine, the operation becomes a comparatively simple one and may be compared to the mixing and laying of ordinary concrete. In fact, the whole process has been treated from this standpoint. Everything is done on the street under the eye of one superintendent. The asphalt used has been chosen specially with reference to its suitability for this kind of pavement. It is a pure bitumen ready fluxed for use, of comparatively low melting or flow point, but is particularly constant under changes of temperature.

The ideal pavement of this class should have the maximum amount of coarse stone in its composition and the minimum amount of dust, or no dust at all. The omission of dust will give it the desired rubbery qualities and increase the binding quality of the bitumen.

Composite Brick and Concrete Building Construction

One obstacle in the way of securing cheapness in constructing reinforced concrete buildings is the cost of the expensive wall forms, which frequently cannot be used again. Mr. F. W. Dean, mill engineer and architect of Boston, has recently designed a number of buildings with brick walls and reinforced concrete floors and roofs, which remove this obstacle and overcome the objections frequently urged against the appearance of reinforced concrete buildings unless the owners are prepared to spend sufficient money to finish them up in an attractive manner. Unfortunately this is not always done in buildings of the manufacturing type. In the buildings above referred to the concrete girders and floor slabs are connected to the brick work without difficulty. The advantages of a reinforced concrete building are thus obtained at a cost, it is stated, less than that of a building with concrete walls.

The accompanying illustration shows the method of construction employed. This particular building, 48 feet 4 inches wide by 82 feet long in outside measurement, is two storeys in height, with basement. The foundations are of concrete carried well below grade; the walls above are of brick, 12 inches thick, between pilasters of 20-inch thickness. Floors and roof are of concrete reinforced by galvanized wire cloth. The first and second floors, 6½ inches thick, including monolithic finish, are supported by reinforced concrete beams running crosswise of the building. These beams, 30 inches in depth by 12 inches in thickness, rest at their ends on the brick wall pilasters, and at the middle are supported by reinforced concrete columns. They extend 16 inches into the pilasters and are bonded thereto by 1-inch parallel steel rods embedded in the walls. These rods, two at each end of the beam, pierce its ends at right angles. On the sides of the building the floors butt against the brick walls, the granolithic finish filling in or smoothing over any space between the two. But at the ends these floors and the integral longitudinal hatch beams extend into and rest on the brick walls. The roof, 4 inches thick, is also reinforced with wire cloth and bonded to the walls upon which it rests. The cornice, properly reinforced, overhangs 18 inches beyond the face of the pilasters.



Building with Brick Walls and Concrete Floors and Columns.

G.T.R's Plans for Toronto and Montreal

Speaking in London, Ont., last week, Mr. Chas. M. Hayes, general manager of the G.T.R., had this to say concerning his company's plans:

"In Toronto and Montreal we have expenditures confronting us reaching into the millions in both places. Toronto will probably be commenced this year. When Montreal will be commenced I cannot say. When we do commence it will be a big undertaking, and these two big works stand ahead of claims coming from other directions."

Mr. A. O. Powell, of Seattle, has been appointed arbitrator in the dispute between the city of New Westminster and the engineering firm of Hermon & Burwell, in connection with the fees charged by the latter for work on the Coquitlam pipe line.

LEGAL DEPARTMENT

Information for this Department is requested from Architects, Engineers, Contractors and Builders. Send in the particulars of recent cases in which you were interested giving the main facts tersely.

Injury to Workman—Application was made in the district court of Edmonton by one Allen Murray, a workman, to secure compensation from his employers, Messrs. Foley, Welsh & Stewart, railway contractors. The applicant was a bridge carpenter and sustained an injury to his foot by being knocked off a trestle bridge on G. T. P. construction work, near Edmonton. The accident occurred on the 25th of February. Following this he was confined to the camp for three weeks and then removed to the hospital for treatment. He was subsequently discharged from the hospital, but until the time of hearing had been unable to perform any work. He claimed compensation at the rate of $9 a week.

The respondents denied their liability to pay compensation under the Act, and contended that, as contractors for the construction of the Grand Trunk Pacific Railway, they were subject to the exclusive legislative authority of the Parliament of Canada; that, in pursuance of such legislative authority, the Parliament of Canada had made applicable to such work the provisions of the Public Works Health Act, and the applicant came under the provisions of that Act, and received medical attendance in pursuance of its regulations; and that the Workmen's Compensation Act did not apply.

The court held that the Public Works Health Act does not in any way cover compensation for injury that may be incurred to any workmen. It is for the purpose of compelling certain contractors or companies engaged in public works to properly care for the health of the workmen and make the camps sanitary. It is also for the purpose of compelling them to have within reasonable distance of the workmen proper medical men and hospital accommodation to care for any of the workmen who may become sick or injured, as it is well known that most of these works are carried on at long distances from places where medical care or accommodation for the sick or injured is to be had. The Workmen's Compensation Act is to reimburse the workman for injuries which incapacitate him for work and applies to such construction work as that upon which the claimant was engaged.

Possession Nine-Tenths of the Law—Edmonton Concrete Company v. C[illegible]all. This action was appealed by the plaintiffs from the judgment of the trial judge dismissing the action. Plaintiffs were engaged in the manufacture of concrete at Edmonton, and for that purpose required a large quantity of washed gravel. They accordingly entered into a contract with the Northern Dredging Company, who operated a gold dredge on the river Saskatchewan, to purchase from that company the gravel which was washed in passing through the dredge. By the terms of the written contract, the washed gravel was to be delivered in barges, to be supplied by the plaintiffs at the dredge, but, by a subsequent arrangement between the two companies, it was deposited in piles in the river, or on the shore, at the rear end of the dredge, in the process which had been carried on by it in running through the gravel bar. One of these piles was at the bar where the dredge had been laid up for the winter. One Burrill, a servant of the dredging company, who lived on the bank of the river adjacent to where the dredge was laid up, was placed by that company in charge of it, as well as of the pile of gravel at that point. He posted up a notice upon the end of the pile nearest to the dredge, the notice being to the effect that the gravel was the property of that company, and forbidding the removal of the portion of the pile nearest to the dredge. It appears that that portion of the pile was required to be retained in order to protect the dredge against floating ice in the spring.

The plaintiffs also posted a notice upon the other end of the pile, claiming to be the owners of the gravel and forbidding its removal. About the 1st of February, 1909, the defendants, or one of them, came to the pile with three teams, and started to remove gravel.

The notices referred to were posted up at that time, and, while they were loading the gravel, they were warned both by Burrill and the plaintiffs' manager not to remove the same, but the loads were completed and carried away. The plaintiffs immediately commenced this action, claiming damages for the gravel removed and an injunction restraining further removals, and obtained an interim injunction.

At the first trial it was held that the plaintiffs were not in possession of the gravel and judgment was given for the defendants with costs. The trial judge contended that any judgment to the contrary would be to hold that the plaintiffs could take possession of all the gravel beds in the river and prevent any person other than grantees of the Crown from removing any gravel therefrom. In the appeal it was held that the person in actual possession of land or goods, though not an owner, is entitled to retain possession against everyone but the rightful owner. The Crown, the true owner, could prevent plaintiffs from getting any benefit from the gravel, notwithstanding the expenditure of labor on it. While they had no property rights in the gravel they could maintain their claim against others by having it in possession. The appeal was allowed with costs, the plaintiffs being granted the injunction asked and reference as to damages.

Dispute Over Contract for Waterworks and Sewerage System—This was an action brought in the Prince Edward Island court asking that an agreement made between the complainant and the defendants for the construction of a system of water supply and sewerage for the town of Summerside for the sum of 73,000 having been obtained by misrepresentation on the part of the defendants, be cancelled, and that an enquiry be made as to what damages the complainant sustained by reason of such misrepresentation; or in the alternative, that such agreement be rectified by inserting the sum of $73,958.14 in the place of $73,000, and by striking out all reference to the construction of a power house as part of such system. The complainant claimed in his bill that his contract to install such system was not intended to cover the erection of power house costing $1,625.

The complainant put in one general tender for $73,958.14 and also several separate tenders for certain portions of the work, and for the materials. The plaintiff claimed that he was induced to reduce his tender $958.14 on the representation of the commissioners that if he did so they would assign to him a tender of L. H. Gaudry & Company for the iron pipe to be used in the work, which tender was some $2,000 less than plaintiff's separate tender therefor; that being so induced he signed the contract for a similar amount, but that the commissioners afterwards refused to assign the Gaudry tender to him, claiming an after-discovery that such tender [illegible] ity in accordance with the specifications for the work. Subsequently it was shown that Gaudry & Company's tender was duly considered by the commissioners after consideration in the matter of certain pipe, for the difference in which plaintiff was properly compensated. The plaintiff further claimed that the commissioners misled him by telling him that they could buy pipe cheaper than he could by some $2,000 and that he had reduced his bid but that the commissioners had not been able to fulfil their promise.

The judgment of the court revolved principally upon the agreement signed by the contractor in which he agreed to furnish all material and labor for the complete installation of a system of waterworks and sewerage for a certain price. The court concluded:

"You would not expect from a contractor, seeking such a contract, a want of knowledge of what a 'complete installation' of a system of waterworks meant, what it could possibly mean without a pumping station? Or that he would ever contend, when his agreement binds him to make, erect and build such a system for a specified sum, and requires him to erect this pumping station in advance of other portions of his work, that he never intended to build this pumping station except for the sum of $1,625 additional." The action was dismissed with costs.

Personal News and Notes

The Edmonton city council has decided to engage a New York expert to map out the city's sewer system.

Mr. C. H. Fullerton, town engineer of New Liskeard, Ont., has been elected a member of the council of management of the Ontario Land Surveyors' Association.

The death occurred last week at Winnipeg of Alexander McCurdy, a former contractor on the C.P.R. to Winnipeg. Deceased was born in Antrim county, Ireland, 83 years ago.

Mr. A. E. Jupp assistant engineer in the roadway department at Toronto, is leaving the city to take a position at Haileybury, Ont., where he will obtain an appreciable increase in salary.

Mr. McGregor, of Ridgetown, Ont., a graduate of the School of Practical Science, Toronto, has been appointed to the staff of City Engineer Bell, of St. Thomas, Ont.

Before the Engineers' Club of Toronto last week Mr. H. C. Champ gave an illustrated lecture descriptive of the high pressure fire system at Winnipeg, Man., Prof. Angus presided over a good attendance.

We regret to report the death of Mr. Z. J. Fowler, of the railway contracting firm of O'Brien, Fowler & McDougall, Ottawa, Ont. The late Mr. Fowler was formerly a civil engineer and was a charter member of the Canadian Society of Civil Engineers.

The death occurred recently at Winnipeg of Mr. F. W. Russell, who for some years was engaged in the contracting business at Winnipeg. Deceased was a native of Hastings, Eng. Latterly he had been living at Minneapolis, Minn.

The total assessment of Prince Rupert, B.C., according to figures submitted by Assessor Cuthbert, is $15,330,166, of which $499,590 is represented by buildings. During the last six months there has been great activity in building. It is stated that no less than 805 buildings have been erected on the town site during this period.

Canadian City Engineers

Mr. J. M. Wilson, Moose Jaw, Sask.

Mr. J. M. Wilson, who was recently appointed city engineer of Moose Jaw, Sask., was born at Toronto 27 years ago. He is a graduate in civil engineering of the University of Toronto and an associate member of the Canadian Society of Civil Engineers. After spending some time in the bridge department of the Canada Foundry Company, Mr. Wilson was engaged in making surveys for the 6-foot steel conduit and tunnel across Toronto Bay. Before the tunnel was completed he was transferred to the high pressure fire system and was in charge of the outside work. Mr. Wilson left the employ of the city of Toronto to accept a position with the Wood Products Company of Canada, by whom he was engaged as construction engineer on the large plant erected by the company at Haliburton. Upon the completion of the plant in 1908 Mr. Wilson became general manager for W. H. Oliver & Company, engineers, Toronto, until the beginning of 1910, when he again resumed his former connection with the City Engineer's department. At the time of his appointment to the Moose Jaw position, Mr Wilson was in the Main Drainage Department at Toronto.

Mr. J. M. Wilson, who was recently appointed City Engineer of Moose Jaw, Sask.

The appointment of Mr. Geo. Powell to the position of assistant city engineer of Toronto has been confirmed by the Board of Control of that city. Mr. Murray Stewart has been appointed roadway engineer in Mr. Powell's place.

As previously noted, the City Engineer's Department at Vancouver, B.C., is being reorganized. Instead of having an expert engineer to superintend the whole department, it is probable that the Board of Works will appoint a number of assistant engineers so as to afford an opportunity for the present city engineer, Mr. Clement, to devote more time to improvement work and the development of the city.

Trade News from Montreal

Contractors Satisfied with Season's Developments
Supply Business Active—Important Works Under Way

Montreal Office of the "Contract Record."
April 28th, 1910.

In and around Montreal building operations have commenced in earnest and contractors, on the whole, are being favored with excellent weather conditions. Up to the present time, April rains have not interfered with construction work to any extent and consequently there is a resultant feeling of satisfaction.

Permits are being issued from Inspector Chausse's office at the average rate of 30 each day, and since the first of April have totalled in volume well over the million and a half mark. In the outskirts of the city building construction is proceeding equally as fast. In Maisonneuve, Mr. C. A. Reeves, the local building inspector, predicts a particularly busy season. Since the first of the year permits have been issued totalling a value well over $250,000. The improvements which the St. Lawrence Sugar Refining Company have on hand will reach, it is expected, $80,000. The town council, too, has scheduled a large amount of work in macadamising, street grading, drains, etc., and for this work has voted approximately $600,000. The apparent scarcity of labor is, however, a serious drawback to the carrying out of this work expeditiously.

In Verdun there is a small building boom and permits are being issued with great regularity. Outremont also is busy, judging from Inspector Read's reports. This municipality aims to become a model corporation, and is at present asking the Quebec Legislature to amend their building by-laws to prevent the erection of tenement houses and factories within certain districts.

Supply Business Active

A general improvement is noted in the supply business and dealers report an activity in several lines. Cement is moving very freely and is still quoted at $1.90 per barrel wholesale, f.o.b. Montreal.

The brickyards are commencing to open up for the spring business and their stock is in excellent demand.

Iron pipe and other lines of imported supplies are now on the way by the water routes and can take advantage of summer freight rates.

Paints and oils are quoted at steady figures but are meeting with a good demand from the spring trade.

The announcement of Major Stephens, president of the Harbor Commission, to the effect that navigation will be kept open for eight months instead of six, as formerly, is hailed with delight in all circles and will not be without its effect on the building supply trade.

Improvements to the Harbor Under Way

The work outlined for the present year towards improving the Montreal harbor has been placed under way by the engineering department of the Harbor Commission. The first project to receive attention is the construction of the high level railway tracks from the high level wharves above Victoria pier to a point near Hochelaga and Molson's creek, and for which this year's appropriation is $200,000. Two Government dredges have arrived from Sorel, Que., and commenced operations at the lower end of the harbor. All the work is taken in charge by the harbor engineers.

The Hilda Daw Construction Company have opened an office at 99A Drummond street as an addition to their present office at 207 St. James street.

Dominion Dry Dock Company

The gentlemen who form the Dominion Dry Dock Company, and who expect to construct the docks at Levis and St. John, N.B., are Sir Thomas Shaughnessy, president of the Canadian Pacific Railway Company; Mr. Hugh Andrew Allan, of the shipping firm of H. & A. Allan; George D. Davie and W. M. Dobell, of Quebec; Walter E. Foster, of St. John, N.B.; Lord Pirrie, of the Belfast shipbuilding firm of Harland & Wolff; Sir Robert W. Perks, and Mr. Arthur M. Grenfell, of London, Eng.

Three Subway Companies for Montreal

The Quebec Legislature has chartered three subway companies, viz., the Montreal Street Railway Company, the Montreal Underground & Elevated Railway Company, and the Suburban Tramway & Power Company. All three companies are obliged to spend two million dollars within four years or otherwise forefit their charter.

Canadian Marble Company's Product in Demand

The new plant of the Missisquoi Marble Company, at Philipsburg, Que., is rapidly nearing completion. The company report both their eastern and western business particularly good while the American market is also buying Canadian marble quite extensively.

With their new plant completed and both their old and new factories running night and day and operating to full capacity, the Missisquoi Company have sufficient work ordered to keep them busy for at least the next 30 months.

New Grand Trunk Station for Montreal

At the annual banquet of the Board of Trade in London, Ont., Mr. Chas. M. Hays, president of the Grand Trunk Railway Company, announced the intention of the company to erect large stations at both Toronto and Montreal, the latter mentioned work to be commenced in the near future.

Rosemount's Extensive Plans

The municipality of Rosemount is asking the Quebec Legislature for power to borrow $465,668, to be used for local improvements; $147,207 of this amount to be expended in the construction of the Rosemount boulevard, and sums varying from $3,000 to $90,000 on twelve other streets. The bill empowers the town to borrow $250,000 within the next year.

Location of Work to be Specified

As forecasted in the "Contract Record" some time ago, the Board of Control have dealt with the question of calling tenders for permanent street work and have definitely decided to have the names of streets upon which the work is to be carried out, mentioned in the calls for tenders. This gives the contractor the additional advantage of being able to figure out the cost of handling material and of studying the natural conditions. Former tenders did not specify the location of the work and the contractor, to protect himself, naturally had to figure on the longest possible distance from the base of supplies.

Personal and News Notes

Examinations for admission to the study of architecture will be held in the rooms of the Province of Quebec Association of Architects, 5 Beaver Hall Square, Montreal, and at the City Hall, Quebec City, commencing July 25th.

The old Union Building, situated at the head of Hospital street on St. Francois Xavier street, is undergoing extensive alterations and will be transformed into a modern office building. The Hilda Daw Construction Company have charge of the work for the proprietor, Alderman Robinson. The foundations have practically been rebuilt and the ground floor completed.

J. Ulric Leclaire, a plastering contractor, Duquette street, has assigned. His liabilities are placed at $[illegible].

The Point St. Charles Grand Trunk shops have completed the first of 25 heavy fast locomotives ordered for western passenger service.

Mr. Foley, of Messrs. Hering, Fuller, Johnston & Monaghan, a New York engineering firm, has been instructed to prepare a report upon the proper filtration methods which the city should adopt to obtain a pure water supply.

Mr. Adolphe Reeves, formerly building inspector of the town of St. Louis, has joined Inspector Chausse's staff and will have charge of buildings in the Laurier Ward.

Mr. Thomas O. Sinclair, formerly associated with the Hall Engineering Works and the Clyde Iron Works, has acquired the Scotia Engineering Works, at 11 Busby lane, succeeding the late Andrew Young.

The Canadian Sand Blast Company have completed their contract on the Lake of Woods building, St. Sacrament street, which called for the cleaning of that part of the walls remaining intact in the recent rebuilding operations.

Messrs. A. C. Leslie & Company, Limited, Canadian managers for John Lysaght, Limited, Bristol, Eng., have just received a cable from this firm stating that 1,760 tons of galvanized and black irons are being shipped to them via the steamer Turcoman, of the Dominion Line, which is due to arrive in Montreal in the course of a week. The Canadian market is using galvanized and other irons quite extensively.

Major Stephens, president of the Montreal Board of Harbor Commissioners, has returned to the city after an extended visit to the Continent.

Mr. Norman H. Cronk, late of the firm of Cronk & Company, of Pall Mall, London and Kent, has been appointed assistant engineer and surveyor for the Hilder Daw Construction Company.

A deputation from the Montreal Builders' Exchange recently waited upon the Board of Control and made a request that the plans of all the city's public works be placed on exhibition at the Builders' Exchange rooms. The Board of Control have promised to give the matter their attention.

Mussens, Limited, have removed their head office to new and commodious quarters at 318 St. James street, almost directly opposite their former premises. The new building is a five-storey structure with a basement and will be used exclusively for showrooms and office purposes.

Messrs. John Stewart & Company have commenced operations on the foundation and excavation work for the new Y.M.C.A. building on Drummond street.

A card bearing the names of the new Board of Control and city aldermen has been issued from the City Clerk's Department. In addition, the card contains some interesting statistics of Montreal. The population is placed at 450,000 and the city has 257 miles of streets, only 60 miles being paved. It also states that the corporation owns 232 miles of brick sewers and that there are 36,730,992 gallons of water pumped daily.

Gravel for Laying Dust

The C. P. R. has made an appropriation of $250,000, which will be expended in spreading selected gravel and broken stone over the grade to reduce the amount of flying dust on the line between Fort William and Winnipeg. This is the method adopted by some of the best railways of the world to secure this end, and it will be used for the first time this year by the Canadian Pacific. The company has used vast quantities of gravel in previous years, but the object sought at that time was the improvement of the road bed

In the United States the experiment has been made of spraying the roadbed with oil to abate the dust nuisance. The result has not been such as to lead to the universal use of oil for this purpose, and nothing of the kind has yet been done on the C.P.R. in the west.

Brick Scarce at Winnipeg

Buildings Statistics and Forecast for 1910—Is Shortage of Brick Attributable to Winter Operations?

Office of the "Contract Record."
Winnipeg, April 22nd, 1910.

Building permits issued from the first of the year are now approaching the four and a half million mark. Up to the middle of April the figures were $4,198,400. For the same period of 1909 the figures were little in excess of one and a half million dollars. If the same rate of advance were kept up throughout the year, the permits at the end of the year would total over $25,000,000.

Building Inspector Rodgers, of Winnipeg, has prepared a detailed report of the operations of his department during 1909. The following is a table showing the number of buildings in each class and the approximate cost:

499	Frame dwellings, semi and non-modern....	$ 488,450
937	Frame dwellings, all modern	2,363,000
99	Brick dwellings	537,400
30	Brick veneer dwellings	253,000
105	Stores and garages	300,800
65	Tenements and office blocks	3,017,950
11	Churches, schools and institutes	445,200
58	Warehouses, storehouses, mills, etc.........	899,300
12	Public buildings	286,450
331	Stables, sheds, workshops, etc..............	138,775
795	Additions, alterations and repairs	496,500
2,942		$9,226,825

The progress of building in the western capital during the last ten years is shown by the following statement:

Year	Permits	Building	Cost
1900	530	656	$ 1,441,863
1901	630	820	1,708,557
1902	822	973	2,408,125
1903	1,227	1,593	5,968,400
1904	1,768	2,268	9,651,750
1905	3,349	4,099	10,840,150
1906	3,487	4,204	12,625,950
1907	2,433	2,827	6,309,950
1908	1,544	1,769	5,513,700
1909	2,498	2,492	9,226,825

Brick and Other Materials

There is great activity in all lines of the building industry but there is one disagreeable feature, and that is the scarcity of brick. The unprecedented demand for building material that has been experienced this spring has caused a run on several lines and there is a general tendency to stiffening of prices. Common brick can be obtained for neither love or money, and face brick, fireproofing brick, cement, stone and terra cotta are trending in the same direction.

It is estimated that so far this spring more than five million of brick have been ordered and to-day local stocks are exhausted. Dealers are bringing this material to the city from Portage la Prairie, Beausejour, and Sidney, but the supply is not equal to the demand. The shortage on brick will materially delay work on the larger structures. Brick which previously sold at $10 a thousand is now quoted at $11.

The increase in the cost of brick is due to the shortage, and the shortage, in turn, is caused by the heavy spring demand. The shortage is more noticeable than during any previous year and may be responsible for many extensions to brickyards this summer. Winter building is also blamed for the present shortage. Last winter was practically the first winter in the history of the city when building operations were carried on, and reserve stocks of material were

AUTOFORCE VENTILATING SYSTEM

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Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

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THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

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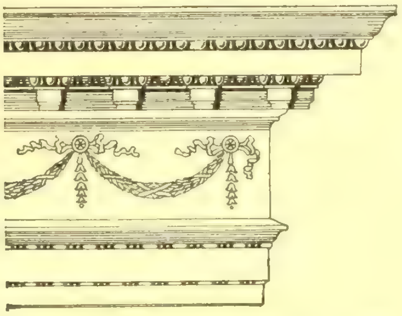
Telephone Main 159

"A good appearance is a letter of recommendation and a [illegible] well built, a monument to the builder."

—The Philosopher of Metal Town.

Superior Quality Material and Workmanship Count

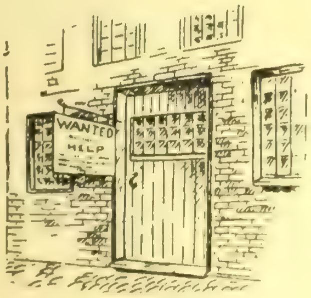
Metallic Cornices



are the MOST ARTISTIC, MOST DURABLE and MOST EASILY ERECTED cornices you can place on any building.
They are made of sheet copper or galvanized steel and are absolutely rust proof.
"Metallic" cornices can be furnished in any design desired to suit your drawings and specifications.
Let us give you prices and full information--send us your specifications. Our catalogue of sheet metal building materials, No. 70, will interest you. Write for it.

Manufacturers 1951

The Metallic Roofing Co Limited
TORONTO & WINNIPEG



In Olden Days

The way to fill a vacant position was to hang out a sign on the Street

The 20th Century Way

is to advertise in the condensed columns of the **Contract Record** where you will get plenty of results.

When you have a vacancy or need a position as draughtsman, clerk of works, building superintendent or in any other, contracting, engineering, municipal or architectural capacity, let us print your want and prove to you the power of this paper.

Contract Record
Toronto - - - Canada

Our Modern facilities and careful attention to details, enable us to give close prices on,

Veneered Doors
Staved Columns
Newel Posts

Let us figure on your needs

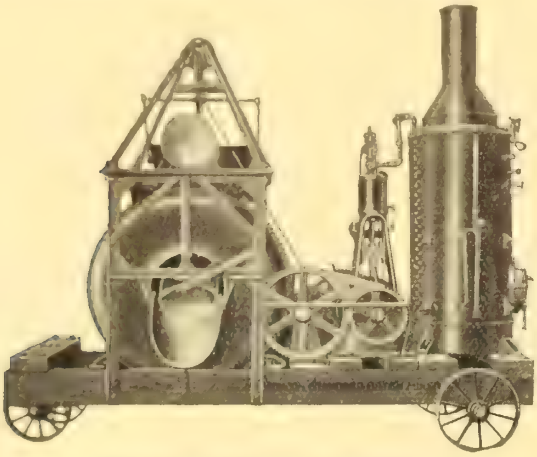
A knowledge of the requirements of contractors and architects demanding a strictly high grade article have enabled us to market the best interior finish.

Batts Limited
50 Pacific Avenue - West Toronto

greatly hindered by this unexpected condition. Supply firms will not be able to overcome the difficulty until new brick is placed upon the market, which will not be for six weeks. The shortage in lumber is due to the increased demand and also to some difficulty encountered in getting British Columbia products through the mountains. Lumber has not become as scarce as brick, and will not delay any building.

An Economical and Up-to-Date Mixer

One of the latest inventions of the London Concrete Machinery Company, London, Ont., is the London Standard Batch Mixer, advertised in this issue. This machine evoked much favorable comment at the recent exhibition of the Canadian Cement and Concrete Association. It is manufactured in three sizes, namely, one-third yard, one-half yard, and one yard batches. The accompanying illustration conveys some idea of the up-to-date equipment of the machine. Features of the London Standard Batch are its simple construction, the small number of wearing parts and the fact that the load is always equally balanced. It discharges rapidly and is built in many styles. From an economical standpoint the manufacturers claim that it cannot be beaten. In addition to this machine the company also manufacture the London Automatic Concrete Mixer.



London Standard Batch Mixer.

Recent Canadian Patents

The following is a list of patents relating to contractors' appliances and building trades. Furnished by Fetherstonhaugh & Company, 5 Elgin street, Ottawa (Russel S. Smart, resident):

124.384. Chas. A Matheson, Perth, Ont.; drying apparatus for peat and the like.

124.470. J. L. Roche, Nominique, Que.; excavator teeth.

124.795. A. M. Ferguson, Hamilton, Ont.; combined step, extension and scaffold ladders; A. M. Ferguson and Wm. H. Bronson.

124.841. P. Boisvert, East Angus, Que.; snow road machines.

124.880. Jno. E. Neyvatte, West Toronto, Ont.; composition matters for pavement construction and similar work.

The annual meeting of the Quebec Land Surveyors was held last week at Quebec. Four of the retiring directors were re-elected without opposition, namely, Messrs. A. Leofred, A. Smith, G. Michaud and M. Sirois. The question of the competition of government surveyors with private firms occasioned quite a discussion, and it was finally decided to appoint a deputation to wait upon the Government and enquire as to whether Government employees could leave their official work to take up outside employment.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

540. Sanitary ware—A Staffordshire firm wish to get into communication with a reliable party in Winnipeg, calling on users of building materials, hardware, etc., to take up the sale of their sanitary ware.

544. Saw—An engineer in the English Midlands manufacturing a patent stone saw which is claimed to have double the speed of the old type, wishes to place his specialty upon the Canadian market.

547. Machinery—A firm in Yorkshire manufacturing ventilating, warming and drying machinery, wish to extend their Canadian business.

551. Steel—A London correspondent representing several important continental steel manufacturers is desirous of opening up Canadian business connections.

552. Agency—A firm in the North of England making a specialty of brick-making machinery and grinding pans and mortar mills would like to be put into communication with a firm in Canada willing to represent them.

616. Hydraulic apparatus for raising water—A London firm are desirous of disposing of the Canadian patent rights in a new hydraulic apparatus for raising water and fluids automatically, which is claimed to be useful for irrigation, draining and sewage purposes, unwatering mines, conveying oil in pipe lines, etc.

618. Sheet metal stampings—A firm in the English Midlands manufacturing sheet metal stampings from half-inch to 42-inch in diameter for the engineering trade, motor manufacturers, electrical engineers, etc., wish to do Canadian business.

633. Agency abroad—A firm in London, Eng., are anxious to get in touch with sellers and agents of second-hand machinery, contractors' plants, etc., for whom they could act on commission in Great Britain.

645. Vitrified blue bricks, etc.—A firm in the English Midlands manufacturing vitrified blue bricks, coping pavings, roofing tiles, etc., wish to be placed in touch with Canadian exporters of these goods.

656. Iron piping, paints, etc.—An inquirer in Barbados is desirous of hearing from Canadian manufacturers exporting iron piping, paints and other articles required in connection with water supply and municipal work.

658. Agents—A Liverpool firm would like to get in communication with municipalities or private firms in Canada to handle their oil gas apparatus for the lighting of towns, works, villages, etc.

697. Overmantels—A South African firm of timber merchants desire to be placed in touch with Canadian shippers of overmantels. Quotations to be f.o.b. Montreal and St. John. Terms cash against documents in New York.

698. Felt roofing—A South African firm of timber merchants desire to be placed in touch with Canadian shippers of felt roofing. Quotations to be f.o.b. Montreal and St. John. Terms cash against documents in New York.

722. Expanded metal—A South African firm desires to be placed in touch with Canadian shippers of expanded metal for building purposes. Quotations to be c.i.f. East London and Durban.

723. Concrete reinforcement—A South African firm desires to be placed in touch with Canadian exporters of concrete reinforcement for building purposes. Quotations to be c.i.f. East London and Durban.

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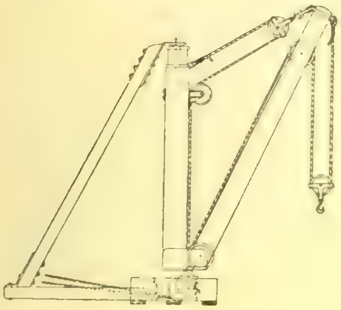

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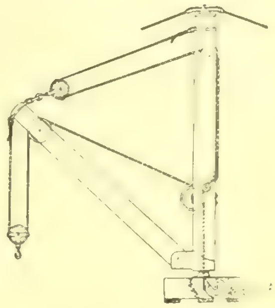

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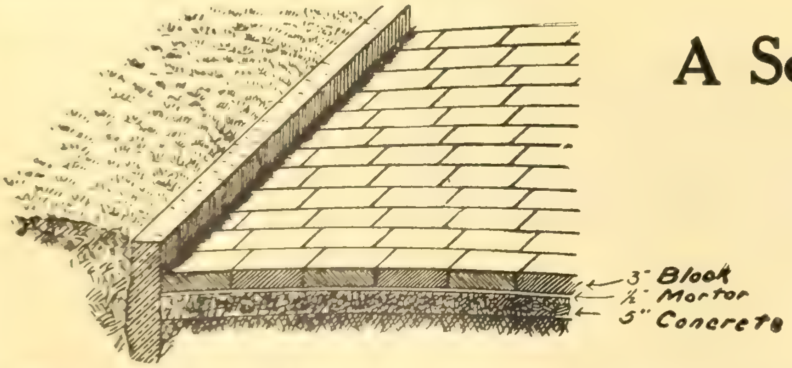

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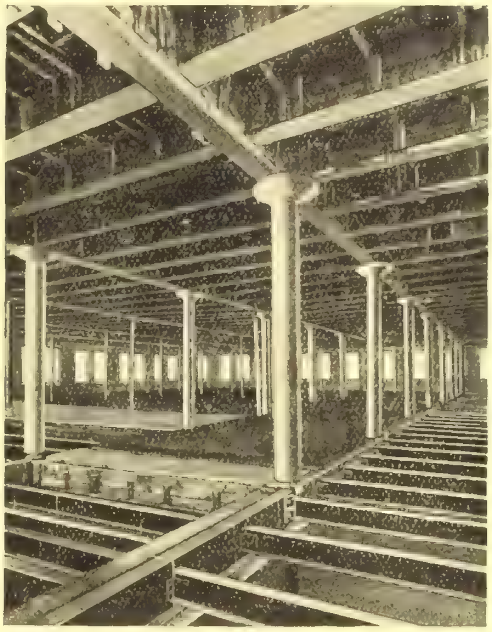

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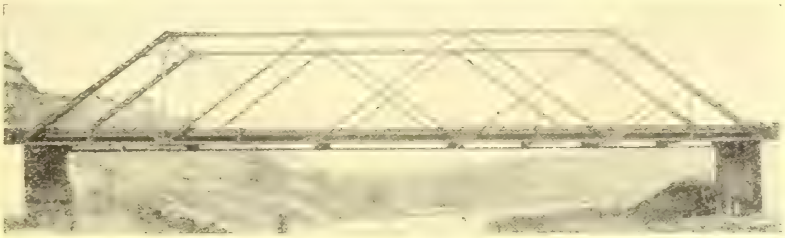

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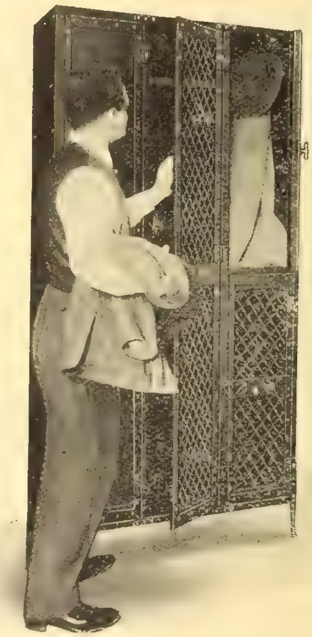

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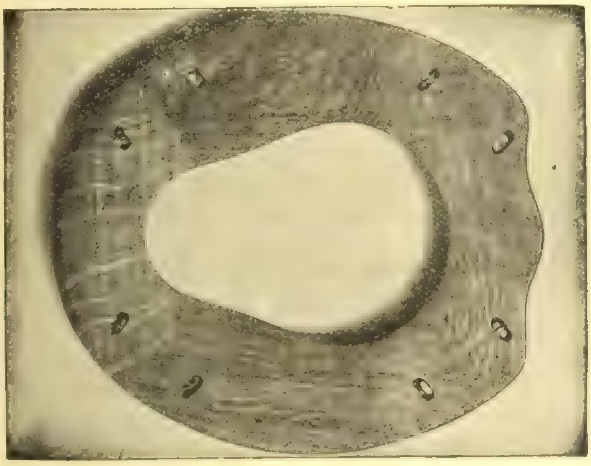

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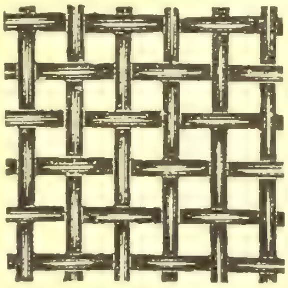

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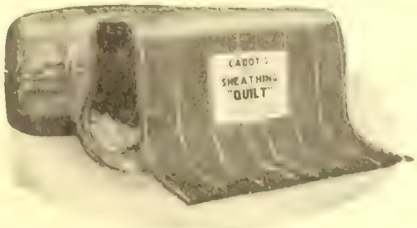

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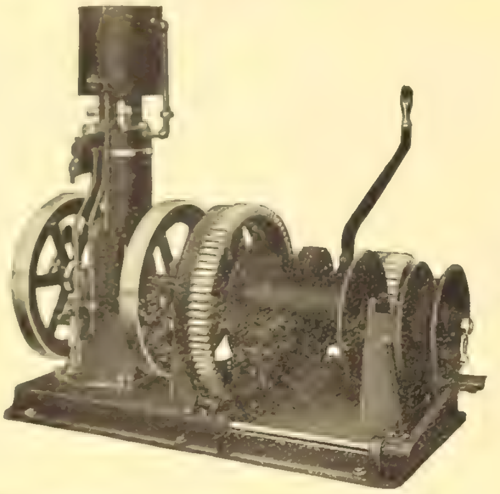

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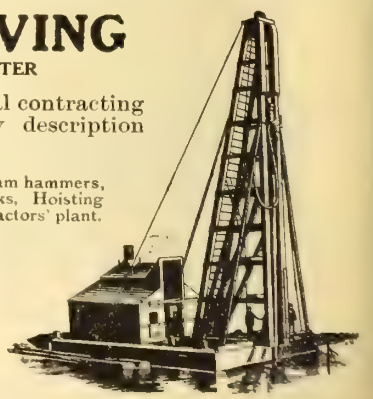

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	Star.	D,D.
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26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
96 to 100 "	....	20.50
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106 to 110 "	....	27.50

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40 u. i.	4.25	3.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i,	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	.,..	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

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(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex. and 3-16-inch round, 35 cents per square foot up.
Floor Tile—½-inch square 45 cents.
Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 25 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish colors, firsts 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G, Cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

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High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Furnaces 45 per cent.; registers 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.; other specials, 40 per cent.

Boilers—Galvanized Iron Range,

30-gallon, standard, $4.75; extra heavy, $7.00.

CastIron Sinks.

16 x 24, $1.00; 18 x 30. $1.15; 18 x 36, $1.95.

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Lead pipe, 25 per cent. off; lead waste, 25 per cent. off; caulking lead, 4¾ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

7 and 8-inch pipe, 40 per cent.

Light pipe 60 and 10 per cent.; fittings, 70, 50 and 10 per cent.

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Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b, Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto,
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3,50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per thousand.
Steel channels and beams, $2.75 per 100 pounds, delivered, f.o.b. Toronto.
Lime, per cwt., delivered, 38 cents,
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plasters, $5.50 per ton.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $7.50 to $8.00 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs,
Boiled Linseed Oil, in barrels, 85 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 82 cents per gallon of 9 lbs.
Turpentine, in barrels, 82 cents per gallon of 8 4-10 lbs.
Pure Linseed Oil Putty, 25-lb. tins, $3.50 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.00 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

J. W. Cadieux, plumber, Montreal, Que., has sold out.

Jonas Grant, saw mill proprietor, Maynooth, Ont., has advertised his business for sale.

Charles Van Spencer has registered (The) Hardwood Flooring Company, Montreal, Que.

Labelle Manufacturing Company, Limited, manufacturers plumbers' supplies, is being reorganized.

Henry Sampson, manufacturers of bricks, Brandon, Man., has been succeeded by Robinson & Bell.

Calgary Pressed Brick & Sandstone Company, Limited, Calgary, Alta., has advertised business for sale.

A. Palmer & Company, planing mill proprietors, Charlottetown, P.E.I., have been succeeded by the MacDonald Rowe Woodworking Company, Limited.

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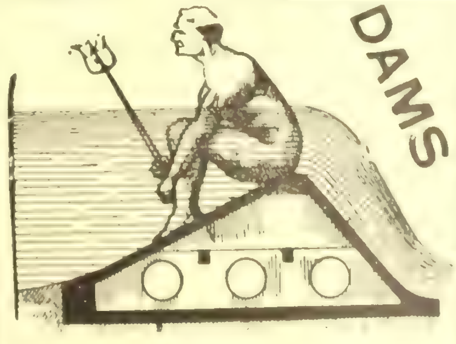

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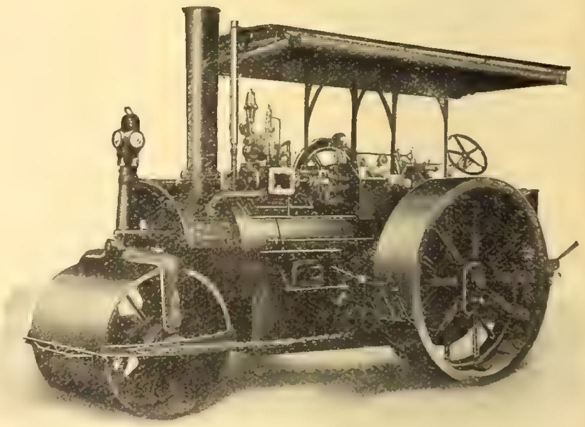

has become the standard of Road Roller construction for the following reasons: Compact and simple, its moving parts are fewer and stronger and its bearings more ample than any other Roller. It is a **double cylinder machine** with cranks set on the quarter, obtaining a uniform thrust and distribution of load and full power transmission at all times. With no dead centers, the Roller can be started from any position on the level or on grade. Steam dome, cylinders, guides and steam chests cast in one piece, avoiding all piping, joints and leaks. Boiler, of the locomotive type of highest fuel economy, and with perfect steaming qualities, quickly fired and easily cleaned. The Roller has **two positive gear speeds**—one fast speed for puddling and finishing and for rapid moving on finished roads. The other slow, for powerful compression and for handling steep grades without increase of steam pressure. Steel yoke, steel boiler and steel shafting make it practically a Steel Roller. Operated entirely from the engineers' platform. All working parts arranged for easy oiling or adjusting, recommending it to the engineer and insuring its long life to the purchaser.

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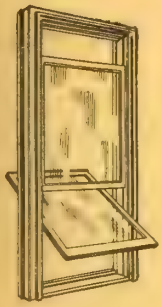

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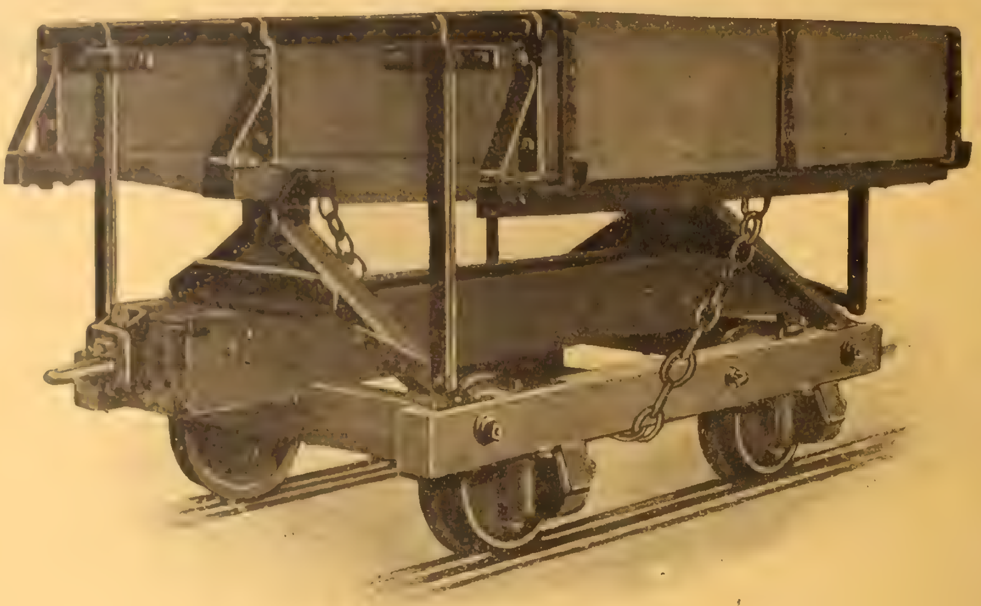

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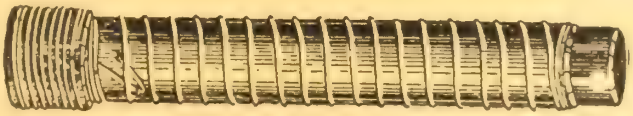

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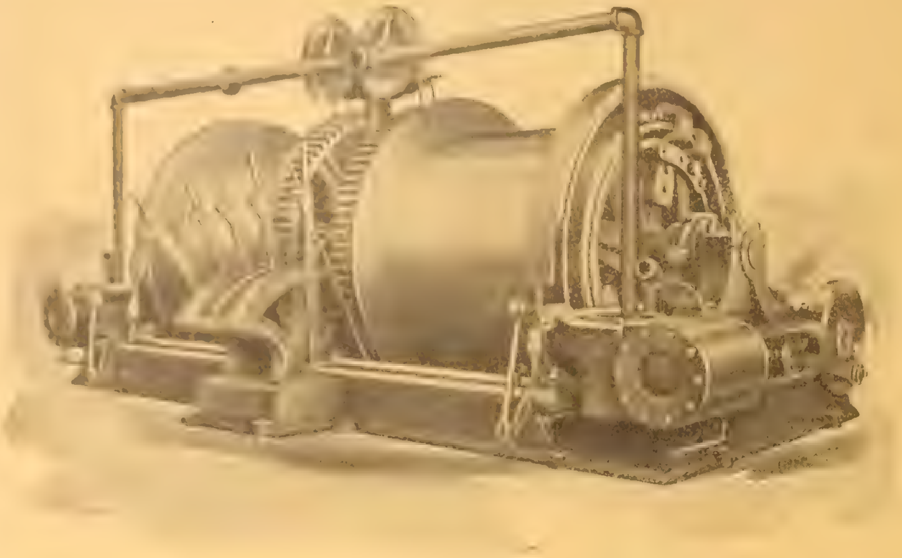

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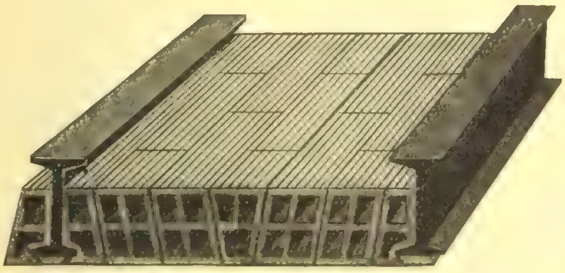
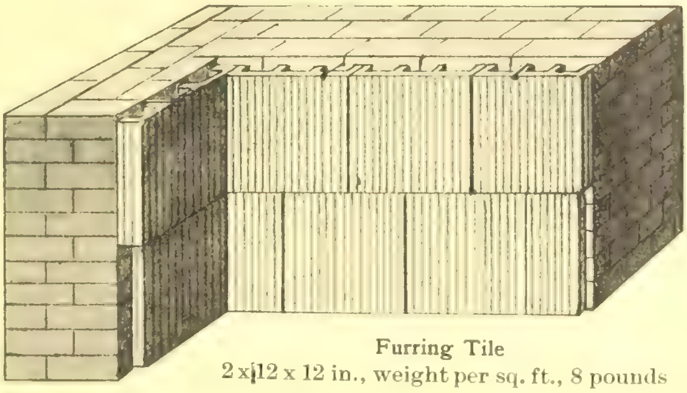


Perspective of Typical Arch



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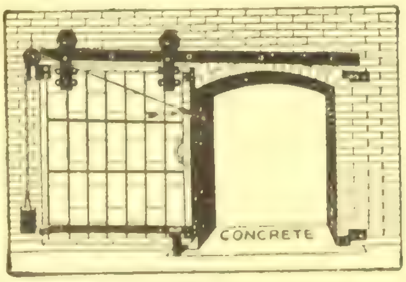

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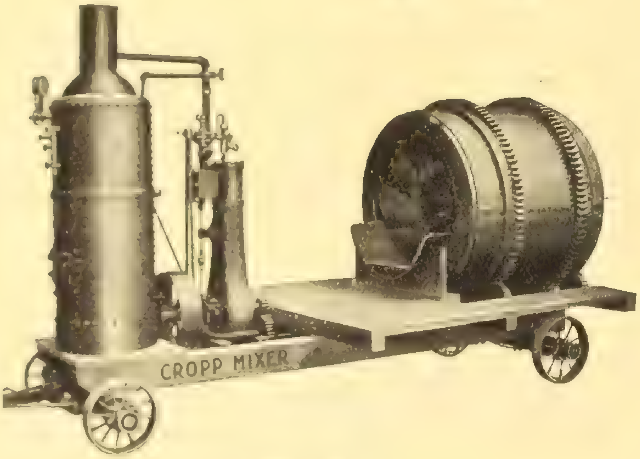
Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

We are bringing out a small Mixer number "O" which holds a One, Two and Four mix. This Mixer is very light and portable—just the thing for small Contractors.

Our Prices
Will Interest You

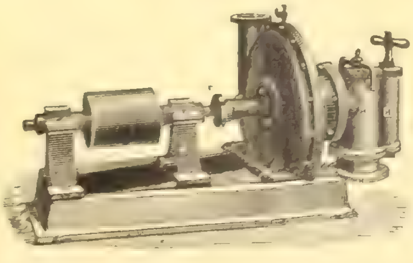
The only Mixer that will not spill when overcharged

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

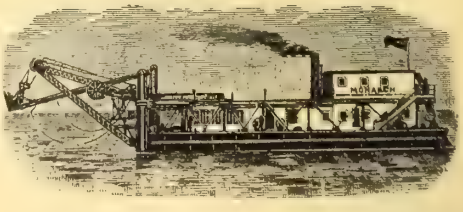
M. Beatty & Sons, Limited
Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

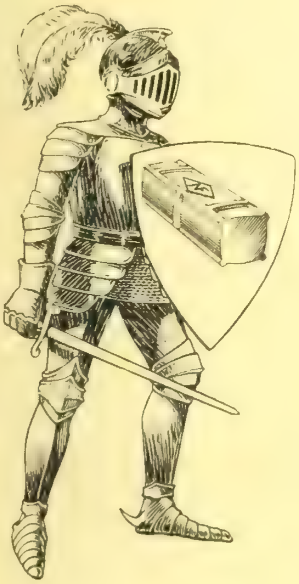
Steel Dump and Deck Scows



Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



The Bar With the Brand is Your Protection



Registered under the Trade Mark and Designs Act.

Bear in mind that the

"NF" Reinforcing Bar for Concrete Construction

is a BRANDED BAR.

Our trade mark is rolled in the bar every three feet.

The reason we brand our product is simply because we believe in it, and want to protect it in every way we can.

Inferior products are often **not** branded, and this will apply largely to reinforcing metals. The "NF" bar is protected by a brand because it is **worthy** of a brand. It is made of the very best material by the most careful process.

We not only make the BAR, but we make also the STEEL the bar is made from. We are the only Steel Company in Canada which MARKETS DIRECT its **own** type of bar made from its **own** steel.

Absolutely no re-rolled metal is used by US. This is not a knock at competition, as it is pretty well known in the building trades that many mills **do use** re-rolled metal.

Consider, then, only the brand "NF" on the bar when making up specifications, and you will be safe.

ONTARIO IRON & STEEL COMPANY, LIMITED

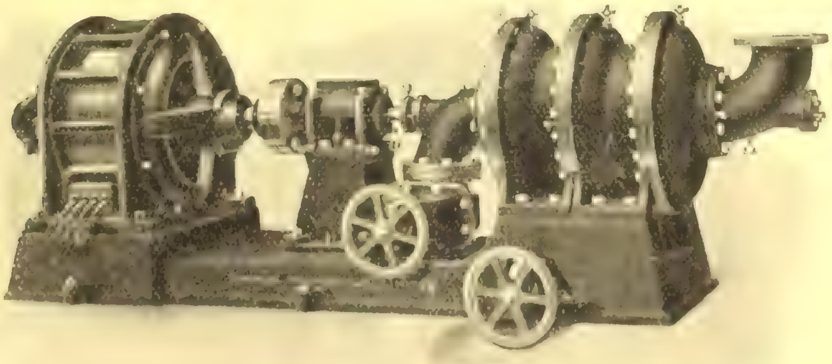
Toronto, Ont., Canada

Motor Driven Turbine Pumps

Simple

Reliable

Efficient



Made for

any

Service

These pumping units are especially adapted for municipalaties desiring to utilize electric power for waterworks service.

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Head Office, TORONTO, Ont.

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

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Extra Special Flexible Steel Wire Ropes

FOR YOUR

Cableways, Cranes and Derricks

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Strong **Flexible** **Durable**

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ANGEL ENGINEERING & SUPPLY CO., St. John's, Nfld.
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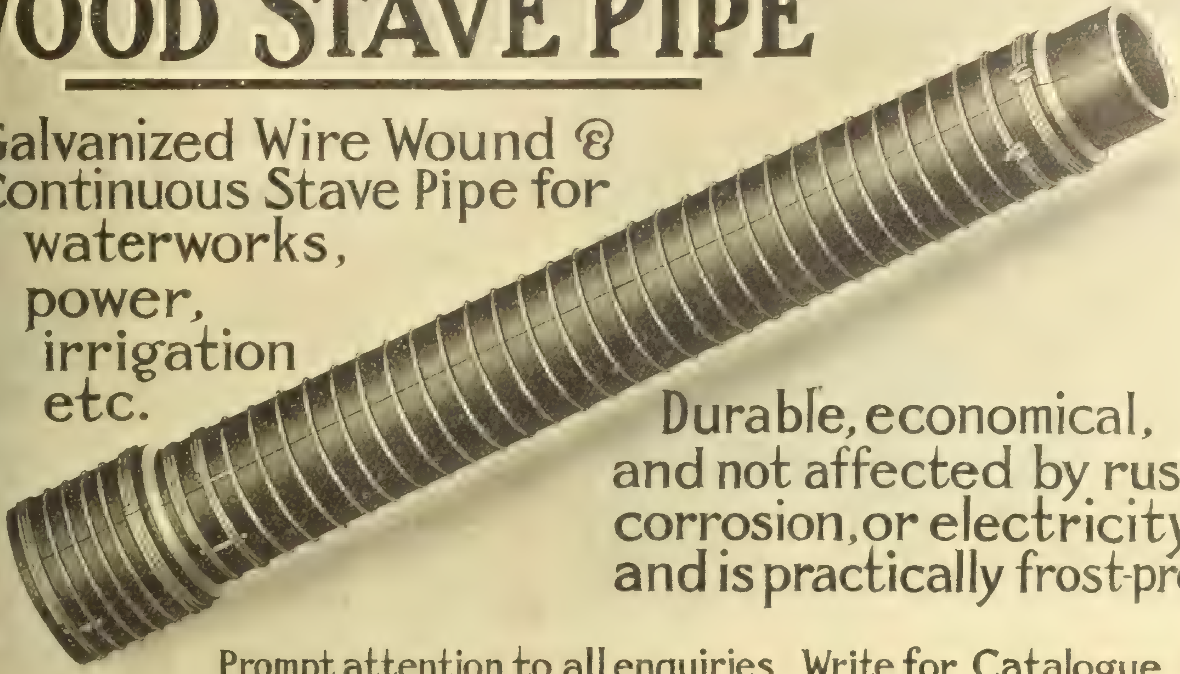

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Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

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WITH
Luxfer Prisms

With this scientific system, daylight entering a room is bent and handled by means of accurately formed Prismatic Angles in such a manner as to insure it being thrown to places where it is wanting. Always specify Luxfer and always get the best daylighting results.

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Two houses erected on Robinson St., for W. G. Bailey, Esq. Steward and Witlor, Architects. Hamilton Pressed Brick are used in above.

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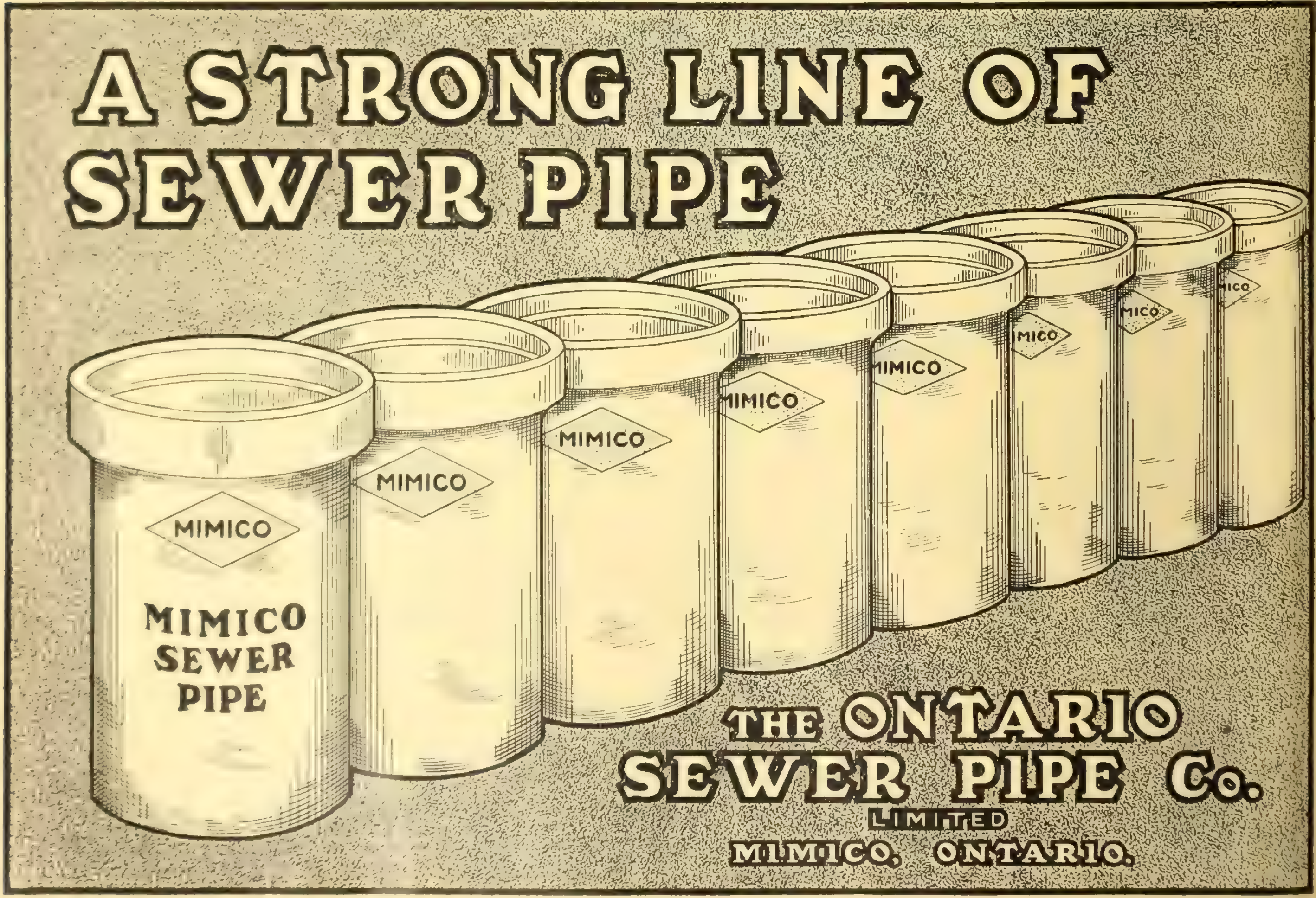
Our shipping facilities are unequalled.

Hamilton Pressed Brick Company

Phone Long Distance 315 and 2931

Head Office: Spectator Bldg., **Hamilton, Ont.**



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—is the only machine that will effectually clean mud and dirt from macadam and stone streets. The teeth or feet are flexible, so that they will follow the indentures of the roadway and the streets can be thoroughly cleaned. Every Municipality should have one or more of these machines. Two horses and a man can thoroughly clean several miles of streets in a day, and it makes no difference how wet and muddy they are—the more so the better This machine has been thoroughly tested for several years, and the following are a few of the points in which it is used :

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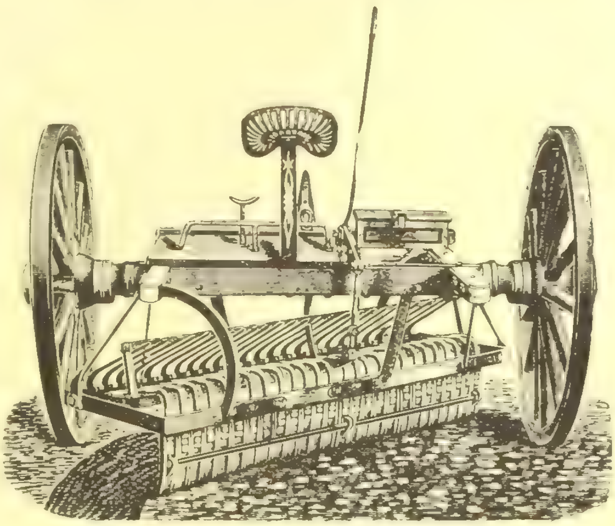

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Brantford "Automatic" Batch Concrete Mixer

WATER
IDEAL AUTOMATIC BATCH MIXER
GOOLD SHAPLEY & MUIR CO LIMITED BRANTFORD CANADA

Two Sizes

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The Geo. B. Meadows Toronto Wire, Iron & Brass Works Co., Limited
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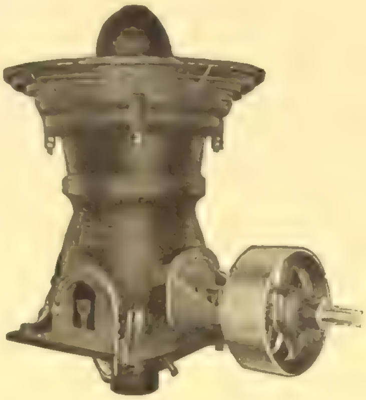

Are you interested in Crushers?
Do you know about the famous

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Investigate a little bit. You'll find the subject interesting, and will want to know more. Begin to-day.

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Power & Mining Machinery Co.
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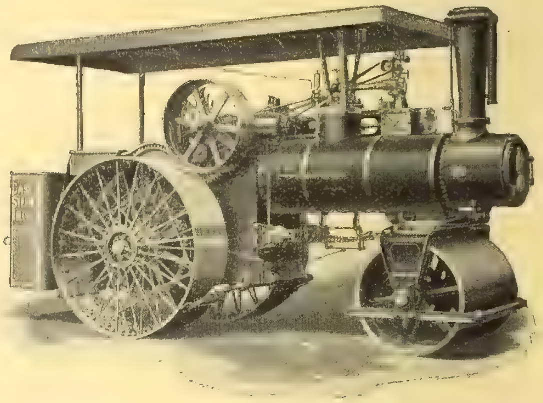

Case 8¼ x 10 in. Cylinder 10-ton Road Roller

Time price, 10-ton, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
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Ten per cent. discount for Cash.
Prices subject to change without notice.

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Guaranteed to do all or Anything that can be done by Any Other Make or Design of Road Roller.

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High Class Interior Fittings

They have facilities for handling all kinds of this work. Architects and Contractors who have good work on hand ought to consult with them before placing orders elsewhere. Estimates given for all kinds of Carpentry and Interior Fitting Work.

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"Standard" in Canada

¶ In order to afford better accomodation to our customers and to facilitate quick delivery of **"Standard"** Plumbing Fixtures in Canada, a factory is in course of erection at Toronto which will be devoted exclusively to the manufacture of **"Standard"** Porcelain Enameled Ware.

¶ The machinery and equipment will be thoroughly modern in every respect, so that the high standard of quality that has always characterized **"Standard"** Goods will distinguish the product of our Canadian factory and the fixtures will carry the same well-known guarantee of excellence.

¶ For the convenience of architects, plumbers and contractors, a large showroom is maintained in Toronto, where **"Standard"** fixtures are displayed and an opportunity afforded to investigate the merits of our well-known product.

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Toronto Showroom and Office
Lombard Street and 59 Richmond Street East

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Wall Coping—Salt Glazed, thoroughly vitrified, covers the wall completely and will outlast the building. Include some in your order for a car of

We are receiving many letters from pleased customers praising the quality of our Pipe.

Write at once for catalogue "C" and discounts.

The

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Canadian Branch of the Robinson Clay Product Co., Akron, O.

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Salt Glazed and Vitrified

SEWER PIPES

True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

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Inverts

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PARK 1809

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SWANSEA (near Toronto)

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Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

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Factories:
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Glazed Earthenware

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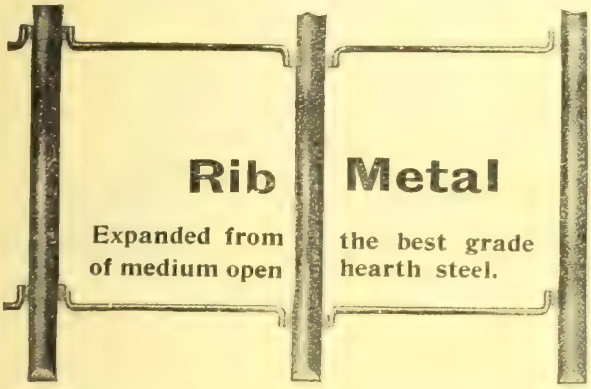
KAHN SYSTEM

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.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Expanded from of medium open
the best grade hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.
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Most Engineers and Contractors

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Established 1860
Large Flanges

Not necessary to chip
HAMILTON PIPE
in making connections.

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Because they know that they will not be held up on delivery.

Because they know that our goods have proven good for 50 years.

Because they know that our prices are always right.

Because they know that our mode of loading insuers safe delivery.

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Insist on our goods and you too will wear that satisfied look.

The Hamilton and Toronto Sewer Pipe Company, Limited
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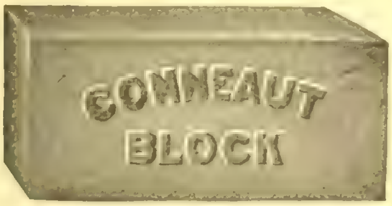
for superior roadway construction.



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Our situation insures foremost shipping facilities to all Canadian Points.

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Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

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Hard Wall Plaster

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

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Hillsborough, New Brunswick, Canada

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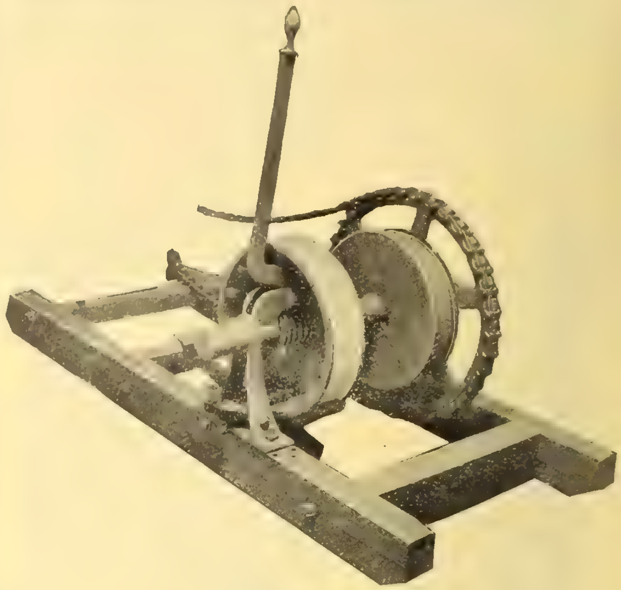

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Here are a few of its many uses

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This hoist can be used with any make or style of gas, gasoline or oil engine

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All Sizes
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STONE

¶ For Roadways and Sidewalks also specially adapted for

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Concrete
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¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

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BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
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It is made promptly.

Don't forget these points when letting your contracts.

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T. A. MORRISON & CO.,
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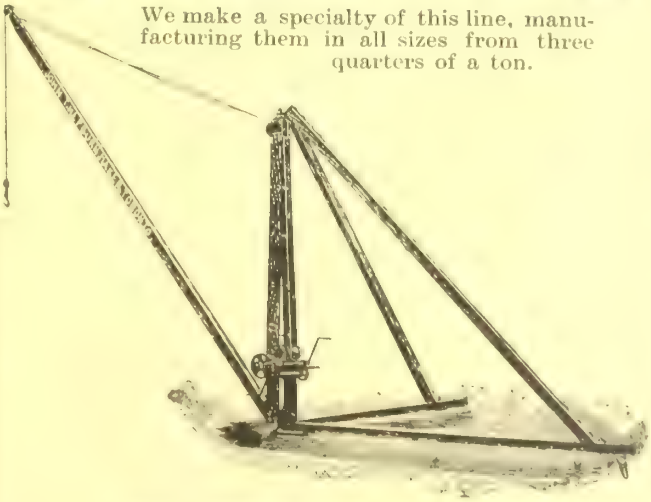
MONTREAL.

Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the "New State" Concrete Mixer.

Demorest Concrete Construction Moulds
Prices on application

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THE TIE THAT BINDS the wires together in

Perfection Wire Mesh

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gives a positive grip in the concrete as well as on the wire. It does not reduce the section of the wire or weaken it by local annealing.

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Door Making is our Specialty

We have equipped our plant with the best door machinery made, and turn out doors that are right in quality and right in price.

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Prompt deliveries. Write for prices.

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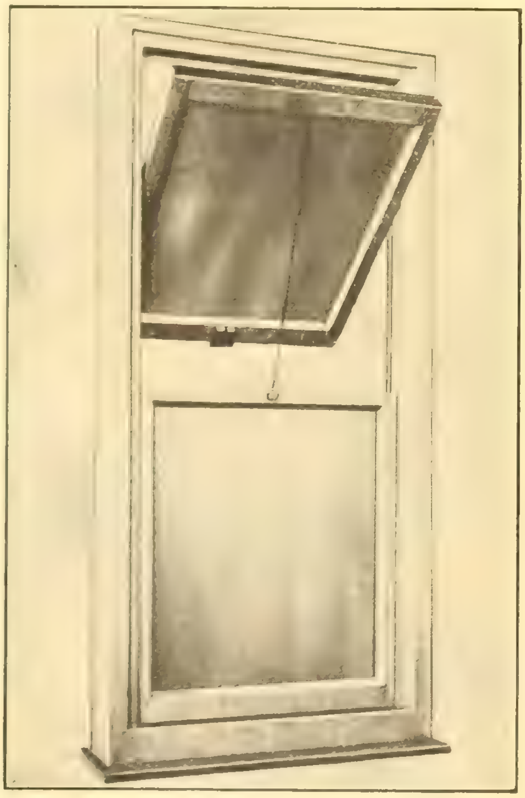
L. A. DeLaplante, Limited

212 Main St., Phone Beach 230 **TORONTO**



Learn the facts about our automatic

Fireproof Windows

Progressive contractors and builders heartily recommend our Fireproof Windows. They do so because our windows reduce the risk of fire spreading. They add greatly to the fire-proofness and safety of a building, They are made strictly according to Canadian Fire Underwriters' Specifications.

Our Fire-proof Windows are made of best galvanized steel, with wired-glass panes. The style shown in cut is in great demand for factory purposes. The window is held open by a chain which has a fusible link. No fire can enter through a window, as the mere heat of a match will melt this link, which causes the chain to part, and the weight of the window closes it automatically.

Write for leaflet which fully explains these windows. Also ask for our prices on fire-proof doors, windows and shutters. We can certainly interest you.

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Messrs Taylor & Taylor, Architects, Brantford, Ontario, say:—"We consider it the only medium whereby the bulk of responsible contractors may be reached by an advertisement in one paper."

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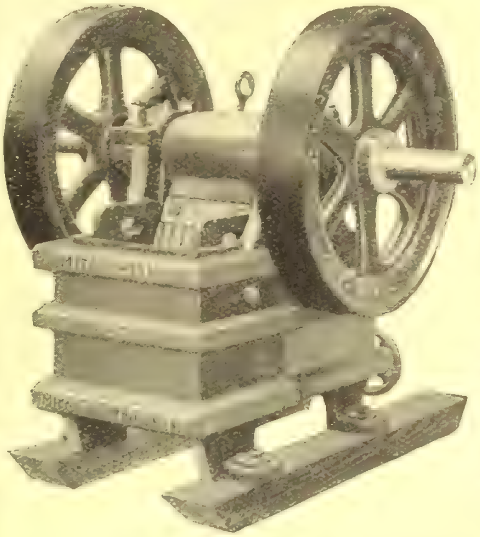
A modest investment in the advertising of proposals will convince you of the service you can secure from the CONTRACT RECORD. Published weekly. Send for sample copy.

Your instructions should reach office of publication Mondays to ensure advertisement appearing in current week's issue.

Contract Record

Toronto - Canada

Mitchells' Stone and Ore Crusher



is the only Crusher on the market which will reduce rock, gravel and sand to dust, if necessary, in one operation.

We are the Canadian Agents for this machine and can supply it in any size and with any equipment.

We have machines DESIGNED ESPECIALLY for CONCRETE BLOCK and TILE PLANTS; Machines DESIGNED ESPECIALLY FOR CONTRACTORS and ROAD BUILDERS and machines DESIGNED ESPECIALLY for ORE CRUSHING.

This Advertisement will not appear again for two months, better send for catalog and state capacity required

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every time.

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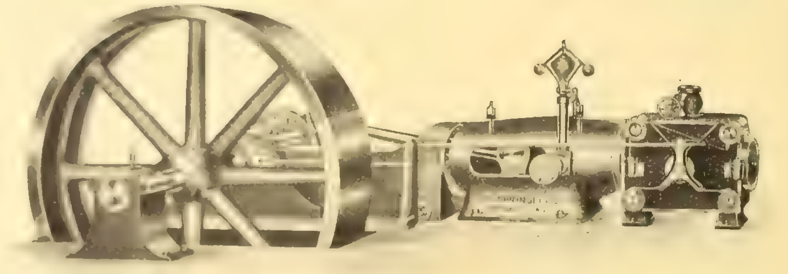

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Bridgeburg, Ont.

Tenders addressed to J. H. Atwood, reeve, will be received until May 16th for material and construction of about 10,000 lineal feet of vitrified pipe sewers, running from 8 to 24 inches in diameter; also septic tanks of 15,000 cubic feet capacity, etc. Plans, etc., at office of R. A. Land, clerk, and also at office of Ross & McCaw, Welland.

Cobalt, Ont.

Tenders are being called until May [illegible] for $25,000 5 per cent 8-year waterworks debentures, guaranteed by Township of Coleman. R. L. O'Gorman, town clerk.

Chippawa, Ont.

A bylaw to raise $27,000 will be submitted shortly for the installation of a waterworks system.

Creston, B.C.

Charles Moore, P. L. S., has been appointed by the Government to carry on the survey for the proposed subway construction and sewerage system.

Fort Frances, Ont.

Tenders will be received until May 26th for extension of sewers. See advertisement in this issue.

High River, Alta.

Messrs. Chipman & Powers, of Toronto, have been asked to outline plans for waterworks here.

Kingston, Ont.

Tenders will be received until May 5th for supply of crude petroleum for road sprinkling. H. B. R. Craig, city engineer.

Lethbridge, Alta.

Council adopted the following estimate of expenditure on anticipated works:—Street grading, $3,000; cement walks, $70,000; sewer main extensions, $40,000; water main extensions, $67,000; plank sidewalks, $4,000; sewer outlet, $42,000; total, $254,000.

North Vancouver, B.C.

Cty Engineer Geo. S. Hanes, has submitted to council his report on the proposed sewerage scheme.

Niagara Falls, Ont.

Tenders addressed to J. H. Jackson, C.E., superintendent, will be received until May [illegible] for construction of [illegible], etc., for different [illegible] feet. Plans at Administration Building.

Magrath, Alta.

The town council has decided to construct a number of cement sidewalks.

Montreal, Que.

Tenders will shortly be called for the construction of pavement and sidewalk work amounting to approximately $[illegible],000.

Richmond, B.C.

Tenders close on the 7th inst. for supply and work in connection with the laying of wood pipe, steel pipe and valves here. Cleveland & Cameron, 506-508 Winch Building, engineers, Vancouver.

Swift Current, Sask.

Mr. J. D. Whitmore, formerly city engineer of Moose Jaw, with Mr. T. A. Murray, is planning a new waterworks and sewerage system for this municipality.

Toronto, Ont.

The awarding of contract to Ryan and Reilly, Philadelphia, for construction of siphon under the Don river, has been postponed for two weeks by the council.

Victoria, B.C.

City Engineer Angus Smith has recommended reservoir repairs to cost $7,500.

Welland, Ont.

Council are considering the construction of a trunk sewer to cost $5,450.

Walkerville, Ont.

Tenders are being called by this municipality for construction of concrete pavement, etc. See advertisement in this issue.

AWARDED.

Calgary, Alta.

J. T. Child, City Engineer, submits list of tenders received for sewer pipe and sewer and water extensions for 1910, also for excavation on subway under C. P. R. at First street east. In regard to the sewer and water extensons the Commissioners have examined the engineer's figures for last year's work and have recommended that the contract be carried out by day labor as in previous years. The lowest tender received for iron castings was from the Alberta Iron Works, as follows: Man hole frame and cover, $14.45; extra man hole covers, $4.50; catch basin, open grate gutter pattern, $6.95; extra gutter gates, $2.15; catch basin, side entrance, $7.90; extra covers for side entrance, $1.95; side entrance castings, $1.35; street railway track drips, $8,90. For cement the lowest tenders were the Canada Cement Company and the Western Canada Cement & Coal Company, who both tendered at $2.63 1-2 per barrel, f.o.b. Calgary, not including sacks. The Rocky Mountain Cement Company tendered at $2.65 per barrel. For concrete curbs the lowest tenderers were Batchelor, Marshall & Skarin, at 42 cents per lineal foot; the highest were Hewson & Boney, at 47 cents. For sewer pipe the Canadian Equipment Company, of Calgary, were the lowest at a bid of $75,638.75 for pipe, $5,638.75 for subways, and $282 for bends. The lowest tender received on subway excavation was from Davidson & Mestaway, Edmonton, Alta., at [illegible] cents [illegible] A. [illegible], at $1, was the highest tenderer in the last named connection.

North Battleford, Sask.

Secretary treasurer S. Cookson, sends us the following list of accepted tenders:—Cast iron pipes and special, Canada Iron Corporation, Limited; hydrants, valves, etc., Canada Foundry Company, Limited; trenching and pipe laying, Wm. Newman Company, Limited, of Winnipeg, and McManus & Marocco, of North Battleford; erection of concrete reservoir, Wm. Newman Company, Limited.

Ottawa Ont.

The contract for the paving of Wellington street has been given to the Barber Asphalt Company, $22,190, the lowest. The other tenderers were: City asphalt plant, $24,804; Union Construction Company, $23,197; Ottawa Construction Company, $24,000.

St. Boniface, Man.

The contract for street paving for the present year was awarded to the Bitulithic and Contracting, Limited. It is estimated that between 50,000 and 75,000 square yards of the former will be laid.

Winnipeg, Man.

The tender of Thos. Jackson & Son for sewer pipe was accepted by the board, $6,755.50.

W. Beverley Robinson, of Montreal, was awarded the contract for cast iron pipe required for waterworks extensions here at $18,131.11. Other bidders and prices:—The Canada Iron Corporation, Limited, Montreal, $18,735.10; United States Cast Iron Pipe & Foundry Company, $20,657.18; Wm. Jacks & Company, Glasgow, $19,731.08; Canada Foundry Company, Toronto, $20,670.75; Bissett & Loucks, partial bid, $20,131.84; Camden Iron Works, partial bid, $19,878.90.

Wetaskiwin, Alta.

The tender of the Canadian Rand Company for pumping equipment has been recommended for acceptance. The following prices per foot for waterworks and sewer construction (referred to the engineer) are as follows:—Waterworks: E. Maunders, Edmonton, 65 cents, 64 cents, 64 3-4 cents, 64 1-2 cents; August Johnston, 70 cents; Geo. Irish, $1.10, 80 cents, 90 cents, 75 cents. Hydrants were quoted at $17 by E. Maunders, while the other bids were at $13. Sewers: August Johnston, 65 cents, 65 cents; Geo. Irish, $1.55, $1, $1, $1.35; Hans Anderson, 85 cents, 60 cents, 70 cents, $1; E. Maunders, 38 3-4 cents, 64 1-2 cents, 67 1-4 cents, 84 cents. Prices quoted on manholes were: A. Johnston, $6; Geo. Irish, $6; H. Anderson, $3.80; E. Maunders, $5.80.

Weston, Ont.

The council have awarded the following contracts: The Smart Turner Manufacturing Company, Hamilton, pumping machinery, $6,758. Other competitors, Canada Foundry, Toronto; John McDougal Caledonian Works, Montreal; Purdy, Mansell, Toronto. Filters: American Water Softener Company, Philadelphia, $2,742; other tenders, the John McDougal Caledonian Works, Roberts Manufacturing Company, Pittsburg Filter Company. Pump house, George W. Moogk, of Waterloo, $4,500; others tenderers, F. C. Taylor, Mount Dennis, Wells & Gray, Toronto.

Railroads, Bridges and Wharves

Brockville, Ont.

Tenders are being called until May 11th for the construction of six bridges, etc. [illegible] & [illegible], consulting engineers. See advertisement in this issue.

Bobcaygeon, Ont.

Tenders are being called until May 5th for the steel superstructure of bridge over Nogey's Creek. E. M. Elliott, county clerk.

Fredericton, N.B.

Tenders are being called until May 9th by Public Works Department for rebuilding Sleepy Bridge, [illegible] County. Plans, etc., at above Department and at the office of G. B. Jones, Apohaqui and of J. E. McAuley, Lower Millstream, King's County.

Merritt, B.C.

The Kettle Valley Railway has called for tenders for building a 20-mile section of the line between Merritt in Nicola valley to Clearwater, a point on the Clearwater river en route to Penticton.

Montreal, Que.

Plans have been prepared by the Grand Trunk Railway Company to eliminate all their grade crossings in the city of Montreal, and they have asked the Board of Railway Commissioners to ratify this work.

The Railroad Commission have ordered the construction of a bridge at Rockfield, Que., to span both the Grand Trunk and Montreal Park and Island Railway tracks. The cost to be divided as follows: G. T. R., 50 per cent.; M. P. & I. Company, 14 per cent.; municipality of Lachine, 10 per cent.; Lachine parish, the town of St. Piere and Montreal Turnpike Trust 2 per cent. each; Dominion Government, 20 per cent.

Ottawa, Ont.

The following items are culled from the supplementary estimates for fiscal year ending March 31, 1911:—Hudson Bay Railroad, construction, $500,000; Quebec Bridge, construction, $500,000; St. Ours, wharf one east side of River Richelieu, $5,500; Nova Scotia, Shubencadie river, enlargement of span on D. A. R. bridge and construction of warping piers, $23,000; Three Fathom Harbour, breakwater, $4,000; Woods Harbour, breakwater, $4,000; Prince Edward Island, Miminegash Harbour, breakwater pier, $3,500; New Brunswick, Campbellton, additional deep water wharf accommodation, $25,000; Alberta, Edmonton bridge across North Saskatchewan river, $10,000; Ontario, extension of Sapper's and Dufferin bridges, Ottawa City. British Columbia: Burton city, wharf on east side of stream between Upper and Lower Arrow Lakes, $6,000; Columbia and Kootenay rivers, wharves, $14,000; Fraser and Thompson rivers, wharves, $15,000; Skidgate, Graham Island, wharf, $5,000; Sooke Harbour, improvement of entrance, $5,000. Ontario—Hamilton, harbour improvements, $20,000; Owen Sound, harbour improvements, $15,000; Port Bruce, extension of west pier, $3,000; Pelee Island, North Bay, extension of wharf, $5,000; Peterborough, wharf on Little Lake at foot of Mark street, $4,500; Pengalley's Landing, pier on north shore of Rice Lake, $5,000; Port Colborne, repairs to head block of eastern breakwater, $10,-

Revelstoke, B.C.

It is reported that next fall the C. P. R. will begin constructing the Arrowhead & Kootenay Railway to connect the main line at Revelstoke with the Crow's Nest road via the Lardeau.

Summerland, B.C.

The C. P. R., it is reported, will erect a cold storage plant, wharves, etc., here. Estimated expenditure, $38,000.

St. Alexis, Que.

Tenders are being called by Department of Public Works, Ottawa, Ont., for extensions and repairs to wharf. N. Tessier, secretary.

Sault Ste. Marie, Ont.

Tenders are called until May 16th for clearing of right of way, construction of bridges, cleaning of cutes and making up embankments on the Algoma Central & Hudson Bay Railway. C. N. Coburn, chief engineer.

Tuscarora, Ont.

Tenders are being called by S. T. McKelvey, township clerk, for construction of concrete abutments for steel bridge, etc. See advertisement in this issue.

Shediac, N.B.

Tenders addressed to N. Tessier, secretary, Department of Public Works, Ottawa, will be received until May 26th for construction of wharf here. Plans, etc., at office of T. P. Shewen, district engineer, Chatham, and on application to local postmaster.

Winnipeg, Man.

Tenders addressed to the Chairman, Board of Control, will be received until June 28th for construction of concrete piers to be completed on or before November 15th; also for erection of steel superstructure and floors. Plans, etc., at office of City Engineer.

AWARDED.

Brantford, Ont.

The following tenders were received for the Market street bridge:—City Engineer, $44,408; A. J. Cromer, Brantford, $49,470; Rutherford & Patten, St. Catharines, $46,400; J. Y. Harper, St. Thomas, $42,468 (accepted); R. Brewder, Ottawa, $50,712; M. M. Hiles, Atwood, $49,000; D. H. Clemens, Berlin, $44,700. Noted in last issue. T. Harry Jones, City Engineer.

J. A. Smith, township clerk, sends us the following list of tenders: Rispin steel bridge superstructure, 80 feet, Western Bridge & Equipment Company, Chatham, Ont., $1,530; Rispin bridge, concrete abutments on piles, $1,230; Fawcett bridge, 24 foot span, $499; Hunter's bridge, 16 foot span, $275, all three to George Thompson, Paris. Construction of Parkdale drain to James Mitchell, Brantford, $1,306.55, township furnishing tile.

Fort William, Ont.

M. H. Braden, of this city, has been awarded the contract for the new addition of the C. P. R. machine shops.

Montreal, Que.

The C. P. R. have recently awarded to the Dominion Bridge Company contracts for the erection of a number of steel bridges, aggregating approximately 2,000 tons. This work is distributed over the eastern and western sections of the company's lines.

Winnipeg, Man.

J. McDiarmid & Company, of Winnipeg, have the contract for construction of freight car shops here, and engine houses at Ignace, Fielo, Roger's Pass, Kamloops and Smelter Junction, for the C. P. R.; A. G. Creelman & Company, of Calgary, and E. J. McGreevy, Winnipeg, the station buildings and section houses.

For the construction of abutments for bridge 24.4, Souris section, the C. P. R. awarded contract to Jas. Kelly, this city.

Public Buildings, Churches, Schools, etc.

Arnprior, Ont.

The school board have decided to improve and add to the high school here. Cost, $14,000.

Amherstburg, Ont.

Tenders will be received until May 9th for the erection of an eight-room school house. Watt, Jacquest & Williamson, architects, Windsor. C. H. Cuddy, secretary.

Brandon, Man.

The council are considering the alteration of city hall. Estimated expenditure, $20,000.

Chilliwack, B.C.

Mr. Neate has been asked to draw plans of hospital. When these are approved by Board, work will be commenced at once. Building committee, J. O. Nichol, A. D. McEachren, Drs. Henderson and McCaffrey.

Coquitlam, B.C.

Competitive designs are invited until May 16th by the Department of Public Works, Victoria, for the laying out of the grounds of the new hospital for the insane here. F. C. Gamble, public works engineer.

Edmonton, Alta.

Superintendent McCaig has recommended the erection of a 12-roomed building between the Norwood and Alexandra Tayfor school districts this year. The residents of Eastwood subdivision have presented a petition for a new school.

Gretna, Man.

A by-law will be submitted at once to raise $10,000 for the purpose of building a new brick school. Plans have been prepared.

London, Ont.

An electric lighting plant will be installed in the hospital here. Estimated cost, $25,000.

Lindsay, Ont.

Tenders are being called until May 16th for erection of school. See advertisement in this issue.

Medicine Hat, Alta.

A new theatre will probably be erected here. Wm. Cousins is interested.

Meaford, Ont.

The council decided to submit a bylaw to raise $32,000 to be applied towards a new school.

Melville, Sask.

Mayor Dawsey is the authority for the statement that a site has been granted to the German Theological College.

Montreal, Que.

Tenders for the construction of the new Hochelaga School building will be received until May 6th. Dalbe Viau, architect.

Tenders for the construction of a public bath in St. Henry Ward will be received until May 6th. L. O. David, city clerk. Alphonse Piche, architect.

Niagara Falls, Ont.

A $15,000 bylaw may be submitted for an extension to the collegiate institute.

New Westminster, B.C.

A Masonic building will be erected on the south side of Agnes street shortly. Approximate cost, $20,000.

A debenture by-law for the sum of $97,-

500, to be applied to the building of three schools, a high school on Tipperary, $60,000; a school at Sapperton, $35,000, and a school on Lulu Island, $2,500, will probably be submitted shortly.

Owen Sound Ont.

Andrew Carnegie has offered this town $25,000 for a free library.

Ottawa, Ont.

The following are culled from the supplementary estimates ending March 31st, 1911: Alberta and Saskatchewan — Calgary, Immigration building, $10,000; Calgary, public building, additions to fittings, etc., $7,000; Lethbridge, public building, $20,000; Moosejaw, new public building, $50,000; Melfort, public building, $5,000; Saskatoon, purchase of land for public buildings, $35,000; Vegreville, public building, $5,000. British Columbia —Kamloops drill hall, addition to building and new heating apparatus, $3,200; Nanaimo public building, extension of, $15,000; Revelstoke public building, $10,000; Vancouver public building, fittings, etc., $16,000; Vancouver old post office building, alterations and fittings, furniture, etc., $15,000. Prince Edward Island — Charlottetown, additional Dominion building, $13,500; Summerside armory, $10,000; Tignish, public building, $5,000; New Brunswick — Chatham public building, enlargement of, $5,000. Quebec —Montreal Postal Station "E", St. Louis du Mile End, addition to, $7,000; Montreal Post Office, renovation of older portions of building, $50,000; Napierville public building, $5,000; Quebec Immigration Building, detention building in Savard Park, $50,000; Quebec Examining Warehouse, fitting up building temporarily for customs purposes and permanent improvements, $10,000; Quebec Immgration buildings, additions, renewals, repairs, etc., additional amount, $6,000; Rigaud public building, $7,000. Ontario—Kingston Royal Military College, additional dormitory accommodation for cadets, $10,000; Ottawa military buildings, new magazine and caretaker's quarters, $7,500; Ottawa Parliament Buildings, improvements, $10,000; Paris, armory, $5,000; Port Perry, public building, $5,000; Peterboro Post Office building, addition to, $10,000; Toronto Meteorological Observatory, to complete fittings, sidewalks, fencing, electric fixtures, etc., $6,000. Nova Scotia — Halifax Citadel, new quarters for single men, $15,000; Yarmouth public building, increased accommodation, $5,000.

Prince Albert, Sask.

[illegible] a modern theatre here.

Port Arthur, Ont.

Peden & McLaren, 20 St. Alexis street, Montreal, are preparing plans and specifications for the erection of a Carnegie library building.

Tenders addressed to Rev. Father J. A. Grenier, this place, will be received until [illegible] church. Plans, etc., at the Presbytery, or at the office of the architect, G. Emile [illegible] Que.

[illegible] 000 banking and office building, cut stone [illegible] Lutheran [illegible] 000. Last named building may not be erected this year, except basement.

Regina, Sask.

Sharron & Tripp are the architects for the new exhibition building. Estimated cost, $15,800.

Rev. L. P. Bergstrom, Winnipeg, has been here looking for a site for a school for Lutheran divinity students. Cost about $30,000.

Rosthern, Sask.

Tenders were called on the 3rd inst. for the erection of Lutheran church at Stoney Hill. Plans, etc., at residence of J. E. Lanz, southeast quarter section 26, township 43, range 5, Laird, Sask.

Stewart, B.C.

An emergency hospital is to be erected.

Port Dalhousie, Ont.

Tenders addressed to A. E. Nicholson, architect, will be received until May 4th for erection of a Roman Catholic school.

St. Catharines, Ont.

Tenders will be received until May 5th for addition to the Nurses' Home, General and Marine Hospital. W. B. Allan, architect.

Sandwich, Ont.

A by-law to raise by debentures the sum of $20,000 for the purpose of erecting offices in connection with tne Court House will be submitted on the 10th July.

Southampton, Ont.

Tenders will be received until May 9th for erection of brick town hall. J. C. Eckford, town clerk.

Sydney, Ont.

A permit has been issued to John Morley, contractor, for an extension of St. Joseph's school. Cost, $5,000.

Toronto, Ont.

A site at the corner of College and Markham streets, has been purchased as a site for the new Masonic hall in the west end.

Property Commisioner Harris has been asked to report on availables sites for a wholesale fruit market building.

The management of the Toronto Bible Training School are considering the erection of a students' residence. President, Rev. C. E. Burrell, Hamilton; secretary-treasurer, H. L. Troyer, Toronto.

Union, Ont.

Tenders will be received until May 14th for the erection of a new school (Seminary School, No. 8, Yarmouth). Plans, etc., at H. McComb's, secretary-treasurer.

Victoria, B.C.

Wm. W. Northcott, purchasing agent, called for tenders until May 2nd for a two-storey building for garbage to be built on wharf on Herald street.

Woodstock, Ont.

Tenders are being called until May 10th for supply of school desks, etc. W. A. E. Ried, secretary Board of Education.

Winnipeg, Man.

[illegible] Control will be received until May 11th for supply of labor and materials for the erection of two stations and drill tower. Plans, etc., at office of A. & W. Melville, architects, 813 Union Bank Building.

Tenders will be called shortly for the erection of the police patrol system office.

The following are members of the Y. M. C. A. Building Committee, in charge [illegible] O. W. McKerchar, H. B. Thompson and J. P. Frith.

AWARDED.

Huntsville, Ont.

Mesrs. Irons & Winnacott have taken the contract for the erection of a large club house at Hollow Lake for Pittsburg tourists.

Halifax, N.S.

S. M. Brockfield & Company, of Halifax, have been awarded the contract for the construction of the new Y. M. C. A. building in this city. Their tender was the lowest. The tenders for plumbing, heating and lighting have not yet been received.

Lakeview, Ont.

J. A. Saxton, chairman building committee, Baptist church, sends us the following list of tenders: T. H. Duscombe, mason, Port Burwell, and H. Z. Balcom, builder, are the acepted tenderers, $4,139.72 (seats, brick, gravel and sand, furnished by the church, also excavation done). Other tenderers, A. Bible, Port Burwell, $4,465, and T. Brady, Port Burwell, $1,800, for mason work only.

Montreal, Que.

The contract for alterations, Lachine market, Lachine, Que., has been awarded to Mr. G. Langlois. Dalbe Viau, architect.

The general contract for the erection of the additional wing to McGill University Medical Building has been awarded to Mr. E. G. M. Cape, general contractor. Brown & Vallance, architects.

Orillia, Ont.

The contract for a new Methodist Sunday school building, 62 x 92 with fifteen class rooms, has been awarded to Mr. Wm. Switzer, at $15,700, exclusive of heating, plumbing and electric work.

Ottawa, Ont.

The contracts awarded for alterations to city hall are as follows: Exterior painting, Ritchie & Nunn, $875; masonry, T. James, $7,875; carpentry, A. Christie, $9,604; plastering, J. J. Green, $4,400; painting and glazing, Ritchie & Nunn, $2,561; plumbing and heating, McKinley & Northwood, $6,145; marble and tile, A. K. Mills & Son, $2,126; electric wiring, J. A. Ellacott, $753; galvanized iron, Modern Machine Company, $540; ornamental iron, Dennis Wire & Iron Company, $4,819.37; steel, E. C. Arnoldi, $1,245; vault doors, J. J. Taylor, $280; fire escapes, J. J. Enright, $474. These were all the lowest tenderers. Tenders for elevator still to be called. Architect, C. P. Meredith.

Picton, Ont.

Jas. H. McDonald, of Point Ann, has secured the contract for the cut stone needed in the construction of the I. O. O. F. hall here.

Vancouver, B.C.

The following tenders for the erection of two fire halls were received: Jas. Layfield, [illegible] $10,675; C. S. Phalen, No. 11, $9,589; R. D. Cowan and F. F. Bennett, No. 4, $15,854; N. G. Patterson, No. 11, $8,500. The lowest tender, those of Cowan & Bennett, for No. 4, $15,854, and N. G. Patterson, for No. 11, $8,500, were accepted.

Residences

Hamilton, Ont.

[illegible] rick & Sons, brick dwelling, Jackson street, for D. Jarvis, $4,000; A. McMullen, two frame dwellings, Harvey street, $2,[illegible]

Montreal, Que.
Tenders were received until April 30th for the construction of a residence on [illegible] avenue for Mr. [illegible]. Hutchison, Wood & Miller, architects.

Port Arthur, Ont.
[illegible] has prepared plans for a [illegible] dwelling for [illegible]. Contract not yet awarded. The same architect has plans for three [illegible] cottages for [illegible] and for a number of smaller dwellings.

Victoria, B.C.
Plans are being prepared for the erection of a [illegible] storey apartment house, corner of [illegible] and [illegible] streets.

Victoria, B.C.
Recent building permits include: Hon. [illegible], frame building, $1,000; B. S. Heisterman, for a two storey dwelling on Elford street, $4,000; R. Pettierew, for a one and a half storey frame dwelling on [illegible] street, [illegible]; James Baker, for a two storey frame dwelling, nine rooms, on Discovery street, $7,000; McPherson & [illegible], for a frame two storey dwelling, [illegible] avenue, $3,800.

Winnipeg, Man.
[illegible] has a permit for apartment block on west side of Hargraves street, $45,000. Contractors, Claydon Bros. Architect, G. G. Teeter.

It is stated the Galbraith Bros., building contractors, have purchased property to the value of [illegible] between Portage avenue and Assiniboine river, where they have taken out permits for residences.

Recent building permits include: John Morris, dwelling, Banning street, $7,200; R. Garne, three dwellings, Gallagher avenue, $2,000; A. J. Rothwell, dwelling, Jubilee avenue, $2,600; P. Gallagher, two dwellings, Leslie street, between Glenwood and Silvia avenues, $5,000; C. V. Wilmot, dwelling, East street, $2,700; Wm. McLean, of Victoria, B.C., five dwellings, Cathedral avenue, $12,500; G. F. Stephens, for private house, $11,000; T. J. McVicar, Arlington street, Preston, $2,500; J. J. Rooney, house, $2,800; R. J. Smith has taken out permits for eight houses to be erected on the north side of McMillan avenue, one $4,000, three $3,500 each, and the remaining four $3,000 apiece; R. J. Mackenzie, conservatory, 245 Kennedy, $2,500; T. J. McVicar, dwelling, Arlington street, $2,500; J. J. Rooney, dwelling, Ruby, $2,800.

A permit was granted for apartment block, River avenue and Lewis street, $90,[illegible] [illegible], owner.

AWARDED.

Montreal, Que.
Contract for the erection of three flats, Alwyn avenue, has been awarded to O. Charivin. Dalbe Viau, architect.

Contracts for the erection of a stable building at Montreal Junction for Mr. T. A. Trenholme, have been awarded as follows: Brickwork, Napoleon Leduc; fenestra, sashes, Expanded Metal & Fireproofing Company, Limited. Peden & McLaren, architects.

St. Boniface, Man.
Omer Dupont, Selkirk, has received a contract to build forty cottages on the Grand Trunk townsite.

Business Buildings and Industrial Plants

Brandon, Man.
Tenders were called until May 3rd for the erection of a brick and stone hotel for H. Johnson. W. A. Elliott, architect.

Black Lake, Que.
Fire caused extensive damage to the sash and door factory of Mr. Pourier, a local contractor, recently.

Cornwall, Ont.
The Rossmore Hotel was destroyed by fire and other buildings badly damaged on the 29th ult. Total estimated loss, $25,000.

Chatham, Ont.
Alex. Kennedy has a permit to erect a two storey brick store, $2,000.

Tenders will shortly be called for a new block. Wilson & Son, architects.

Fonthill, Ont.
It is stated that a new $10,000 hotel will be erected here.

Edmonton, Alta.
W. H. Clark states that the Edmonton Lumber Company's mill recently burned down, will be rebuilt.

Fort William, Ont.
Plans are being prepared by Architect Carl Wirth for the construction of a $60,000 business block for Jas. Murphy. Tenders will be called as soon as plans are completed.

D. McDonald, manager for Revillion Bros., Nepigon, is completing arrangements for his two storey block to be erected on May and Cameron streets. Estimated cost, $15,000. It is proposed to have the building completed by end of September.

Galt, Ont.
The Citizens' Committee and Mr. Jos. Stauffer will confer with the town council as to the desirability of purchasing a tract of land to be used for industrial sites.

Indian Head, Sask.
The Dominion elevator was destroyed by fire on the 29th ult. Total estimated loss, $15,000.

Kingston, Ont.
The North America Smelting Company is negotiating for a site here. Estimated expenditure, $75,000.

London, Ont.
The Watt Manufacturing Company, of Ridgetown, recently burned out, will build a factory here.

Laird, Sask.
The warehouse of the Imperial Oil Company and other buildings were destroyed by fire recently. Estimated loss, $18,000.

Moose Jaw, Sask.
The Board of Trade is interested in the erection of a new hotel here. Mr. Willoughby, president.

Montreal, Que.
Mr. Joseph Perrault, architect, 2106 Park avenue, is calling for tenders for erection of manufacturing buildings for Messrs. Martin-Senour Company, Limited, on Beaumont and Greenshields avenue.

Plans for the remodelling of the Carsley Building are being prepared by Finley & Spence for a Montreal syndicate who will, it is stated, expend $200,000 in converting this building into a modern hotel.

The Transportation Building Company, Limited, has secured a ninety-nine year lease on the Seminary St. Sulpice property fronting on St. James, St. Francois Xavier and Notre Dame streets, and it is stated that they will ultimately erect a modern ten storey office building on this property.

Tenders will be received until May 5th for the construction of the Yorkshire Insurance Building on St. James street. Saxe & Archibald, architects.

D. R. Hanna, vice-president C. N. R., is authority for the statement that the company is considering the expenditure of about $4,000,000 on a central passenger station here. Victoria Square is reported to be favored as a site.

New Westminster, B.C.
The Canadian Bank of Commerce will build a handsome office in this city some time this summer or fall, on Columbia street. Darling & Pearson, Toronto, architects.

Ottawa, Ont.
It is reported that the Reardon Rifle Sight Company will locate here shortly.

The James Power Company, of Toronto, is seeking to locate a factory for the manufacture of motor car requisites. Estimated expenditure on building, $10,000.

It is stated that the C. N. R. is negotiating for possession of the Varsity oval grounds as a site for their new station.

W. E. Noffke, architect, has completed plans for the 3 storey block, corner of Dalhousie and York streets (cost about $100,000), to be erected for Mr. K. Farah.

Prince Rupert, B.C.
Blake Wilson, manager for P. Burns & Company, it is stated, has selected a site for a refrigerator plant, three storeys.

Prince Albert, Sask.
H. H. Ittner intends extending his brick making plant.

Port Colborne, Ont.
The by-law to loan cork factory $10,000 was carried.

Quebec, Que.
Tenders close on the 5th inst. for trades of carpentering, roofing, masonry, etc., in the enlargement of "Kent House," Montmorency Falls, for Quebec Railway, Light, Heat & Power Company. Staveley & Staveley, architects.

Stevensville, Ont.
The planing mill and heading factory owned by John Pierson were destroyed by fire on the 27th ulto. Estimated loss, about $10,000.

Saskatoon, Sask.
The Trussed Concrete Steel Company will erect a $75,000 flour mill here for the Saskatchewan Milling Company.

Toronto, Ont.
A. A. Barthelmes & Company, 91 Niagara street, have a permit to erect a 5 storey and basement factory, $46,000.

The factory of the Blackwell Varnishing Company, 1367 Bathurst street, was badly damaged by fire on the 28th ult. Damage about $5,000.

The Union Bank has secured a permit for its bank on the corner of Bay and King streets, $150,000.

Joseph S. Mack, president of United Textile Corporation, headquarters, Pennsylvania, U.S., has been looking at possible sites for a factory, on which, it is reported, $1,000,000 will be spent. Property Commissioner, Harris.

It is understood that J. L. Nicholls Company, publishers, have purchased 184 Spadina avenue.

Victoria, B.C.
A building permit has been issued for the block to be erected by Finch & Finch, on Yates street, $18,000. Architect, D. C. Frame; contractors, Westholme Lumber Company.

Plans are being prepared by H. S. Griffiths, 1006 Government street, for the 3-storey business block to be erected on the corner of Douglas and Johnson streets for Messrs. Moore and Scott, managers of the Victora Chemical Works, and Hamilton Powder Company, respectively.

Vancouver, B.C.

Wright, Rushford & Cahill are the architects for the 6 storey block on the corner of Davie and Jervis streets. Estimated total expenditure, $157,000.

Winnipeg, Man.

Tenders addressed to P. E. Ryan, secretary Commission of the Transcontinental Railway, will be received until May 25th for the equipment for power house in connection with shops east of Winnipeg. Plans, etc., at office of Chief Engineer, Mr. Gordon Grant, Ottawa, and in the office of District Engineer, St. Boniface, Man.

John D. Atchison is the architect for the new Eastern Townships Bank to be erected on Main street.

The Winnipeg Elevator Company's elevator was destroyed by fire on the 27th ulto.

The building ocupied by A. S. Girvin and others at 575-577 Selkirk avenue, was destroyed by fire on the 23rd ulto. Estimated loss, $4,000.

The Dominion Bank will start immediately on the erection of a handsome terracotta building at the corner of Norte Dame avenue and Nena street.

Thos. Kelly & Son has a permit for 3 storey block, 110 feet on Notre Dame street and 120 feet on Princess street, $70,000. Architect, G. W. Northwood.

The warehouse of Foley Bros., Larsen & Company, were damaged to the extent of about $300,000 on the 29th ult.

AWARDED.

Alliston, Ont.

Wm. Jerreat & Son have secured the contract for the erection of the Home Bank branch.

Montreal, Que.

W.Beverley Robinson has been awarded the contract for the terra cotta work in the H. P. Labelle & Company, Limited, new building, Notre Dame street west. Doulton & Company's "Carrara" terra cotta will be used.

Montreal, Que.

The general contract for the erection of a brewery building for the National Brewery, St. Paul and Dupre streets, has been awarded to J. B. Gratton, Limited, contractors, 82 Mercier street. Cost, $23,500. C. F. Hettinger & Company, architects.

The following sub-contracts have been awarded by the general contractors, Byers & Anglin, for the Alexandria School on Sanguinet street as follows: Electric wiring, Sayer Electric Company; ornamental iron works, F. A. MacKay; plumbing and heating, T. O'Connell; roofing, Sibley & Huot.

Gray & Wighton have been awarded the general contract for the construction of the new Semi-Ready factory building on Guy street. The new building to have four storeys and basement. MacVicar & Heriot, architects.

D. G. Loomis & Sons have been awarded the contract for the construction of a coal pocket for the Montreal Light, Heat & Power Company, in the vicinity of Longue Point. This building is to be constructed of reinforced concrete and will be approximately 100 feet by 200 feet and 40 feet high.

St. Thomas, Ont.

The contracts awarded for the Nursery Shoe Company (A. E. Medcalf, manager) are as follows: Carpentry, J. M. Green & Sons; masonry, A. E. Ponsford; plumbing, J. Williams.

Smith's Falls, Ont.

The contract for the new warehouse of Messrs. Robertson, Nicolle & Company, wholesale grocers, Kingston, has been let to Mr. M. Ryan.

Toronto, Ont.

The following contracts for erection of Canada Linseed Oil Mills plant have been awarded: Reinforced concrete construction and brick work, Leach Concrete Company and C. W. Wood respectively; the grain elevator used in conjunction with the plant will be built by J. H. Tromanhauser.

The Sanitary Floor Company, of Toronto, have been awarded the contracts for laying their sanitary flooring in the Grand Opera Hotel, Adelaide street, and the new hotel for Messrs. Taylor & Baker, Niagara Falls.

Winnipeg, Man.

The Maple Leaf Milling Company have let contracts for the building of 17 elevators in Saskatchewan to the W. A. Harper Construction Company, this city, $102,000.

Power Plants, Electricity and Telephones

Camrose, Alta.

M. A. Maxwell, of Boston, has been asked to draw plans and specifications for an electric plant. Probable site, north bank of Stoney Creek, east of G. T. R. bridge.

Fort Saskatchewan, Alta.

The ratepayers will be asked to vote on the expenditure of $10,000 for construction of electric light plant on Sturgeon river. Mr. Lynn, engineer.

Ingersoll, Ont.

By-laws to raise $39,000 for the purchase of power plant, etc., and another to provide a sum of $15,000 to augment equipment and prepare for distribution of electricity will be submitted to the ratepayers shortly.

Moose Jaw, Sask.

Tenders are being called until May 7th for the erection of telephone building. Plans, etc., on application to Storey & Van Egmond, architects, Regina.

Minnedosa, Man.

This municipality is preparing to call for tenders for the construction of a hydro-electric power plant; power, 500 h.p., to be developed from Little Saskatchewan river. P. H. Mitchell, Traders Bank Building, Toronto, consulting engineer.

Moose Jaw, Sask.

The ratepayers voted in favor of street railway franchise, which goes to a company composed of Ottawa capitalists. An up-to-date system will be installed at once. Noted in issue of April 6th.

Nelson, B.C.

The report that the C. P. R. will electrify the Crow's Nest Pass line is revived by the statement of an incorporation of a company capitalized at $1,000,000 to develop power from the Pend D'Oreille river at its junction with Salmon river.

Ottawa, Ont.

The proposed street railway extensions have been approved by council.

The following are culled from the supplementary estimates, ending March 31, 1911: Maritime Provinces: Hawkesbury, Meat Cove, lines along shore of Gulf of St. Lawrence, renewal of poles, $3,000; Meat Cove, Baddeck line, extension from Baddeck via Nyanza to Little Narows, $2,350. British Columbia, extension of Courtney, Campbell river telephone line from east shore of Vancouver Island, etc., $11,900; Kamloops, Okanagan Valley telegraph and telephone lines, $11,000; Ashcroft-Dawson main line, telegraphic communication between Port Simpson and Stewart, $16,000, etc.

Quebec, Que.

Two lines only of those proposed for construction by M. S. R. have been approved by Legislative Assembly.

Rouleau, Sask.

Tenders will be received until May 14, to overhaul the instruments and generally reconstruct the Riverside Rural Telephone Company's system here. Nine miles of line. C. N. Bonsall, secretary-treasurer.

Victoria, B.C.

B. C. E. R. is planning to create a big summer resort at Cordova Bay, where forty acres of land have been purchased.

Vancouver, B.C.

The following tenders were received:—Northern Electric, 20 miles copper wire at $21.50 per 1,000 feet; 1,000 feet of covered wire, $13 per 5,000 feet; half inch conduits, $5.75 per 100 feet; 1,000 insulators at $45 per 1,000 feet. F. Darling tendered for the same as follows: $21.50, $13.50, $5.85, $24.60. Cope & Son's tender was $1,407 for the lot, and the Canadian General Electric, $1,374 for the lot. These were referred to the city electrician.

Tenders are being received until May 7th by E. A. Earle & Company, 532 Pender street west, for material and work in connection with the proposed system of ornamental street lighting on four streets here.

Winnipeg, Man.

Tenders addressed to the Chairman, Board of Control, will be received until May 16th for the erection of sub-station for the electrical distribution system. Plans, etc., at office of Smith, Kerry & Chace.

Yorkton, Sask.

The town council is considering the installation of an electric light plant at a cost of $24,000.

AWARDED.

Regina, Sask.

The Provincial Department of Railways and Telephones have awarded contracts as follows: Moose Jaw to Outlook, Martinson & McCutcheon, of Elbow; Saskatoon to Humboldt, Simpson & Craig, Virden; Wapella to Carlyle, Martin Misferdt, Alameda, Sask; Abernethy to Esterhazy, with branch to Melville, to R. & D. McLeod, Winnipeg. Construction work to commence by May 1, and completed in two or three months.

Stratford, Ont.

Tenders are to be called almost immediately for the $75,000 electric distribution plant for Stratford.

Victoria, B.C.

The contract has been let to Bryce & Munro, of Sidney, for the telephone line from Victoria to Sidney and local exchanges in North and South Saanich. Work will proceed at once.

Miscellaneous

Chatham, Ont.

Tenders are being received by the Reeve of Chatham township for extensive improvements on the Maxwell drainage outlet. Engineer, G. A. McCubbin, St. Thomas. Estimated expenditure, $11,000.

Edmonton, Alta.

[illegible] money by-laws totalling $613,000, were passed.

Fernie, B.C.

The town has decided to raise $10,000 for street improvements, $[illegible] for schools, [illegible] for [illegible] land [illegible], $1,000 for water [illegible], $[illegible] for surface drainage and $40,000 for sewers.

Grandview, Man.

Tenders will be received up to the 4th May for debentures amounting to $[illegible]. [illegible], secretary-treasurer.

Kingsville, Ont.

The town of Kingsville is offering $5,000 in [illegible] per cent. debentures. Advertisement in this issue.

London, Ont.

Recent building permits include: Mrs. [illegible] W. Adams, for rebuilding the warehouse on York street, $7,000; Mrs. R. R. [illegible], a storey brick veneer on Tecumseh avenue, to cost $[illegible]; George S. Gibbons, alterations to his residence at Ridout and Kent streets, $6,000; H. Fulton, two storey brick residence on Louisa street, $2,000; H. E. Gates, two storey residence, St. James street, $10,000.

Montreal, Que.

Beauharnois canal improvement work, which was undertaken by the Canadian Light & Power Company, will be done by the Canadian General Development Company, between St. Timothee and Valleyfield, while Fraser, Bruce & Company, of New York, will improve the canal mouth. Estimated cost, $750,000.

Recent building permits include:— J. Lemebvre, 410 St. Andre street, two houses containing six dwellings, $5,000; L. Dalbec, 287 Garnier, two houses containing four dwellings, $4,000; J. P. Filion, 120 St. Phillipe, one house, $2,800; Wm. Gilmour, one house containing three dwellings, cost $5,000; P. McMahon, 120 Colborne, one house containing three dwellings, $3,500; P. Denis, 1284 St. Denis, one house containing three dwellings, cost $3,000; G. Martineau, 42 Villeneuve, two houses containing six dwellings, $9,000; T. Girard, 13 Joachin, one house containing five dwellings, $5,600; J. P. Legault, 894 Beaubien, one house containing two houses and two stores, $4,500; G. Gregoire, 1365 St. Lawrence boulevard, one house containing three dwellings, $4,000; John Welch, 490 Mountain street, one house containing dwellings, $10,000; D. Cousineau, St. Urbain, one house containing three dwellings, $3,000; L. Hamelin, 1077 Mount Royal, one house containing six dwellings, $6,000; N. Lavallee, 122 St. Philippe, one house containing five dwellings, $4,300; H. Corbeil, 138 Garnier, four houses containing twelve dwellings, $16,000; Mme. V. A. Thomas, 633 Boulevard St. Joseph, one house containing three dwellings, $4,000; L. Lapierre, 34 Palm, one house containing three dwellings, $5,000; E. Gascon, 868 Berri, one house containing three dwellings, $2,800; D. Depatie, 301 DeCarrieres, two houses containing five dwellings, $5,000; C. H. Blonin, 628 Boulevard St. Joseph, one house containing three dwellings, $5,000; Jos. Demers, 475 Marquette, two houses containing six dwellings and one store, $7,000; A. E. Rae, 401 St. Catherine west, alterations to one store, $11,000; Mme. Alex. MacCombe, 304 Prince Arthur west, alterations to one house and one store, $2,500; John Welch, 490 Mountain, alterations to four houses containing six dwellings, $10,000; Reverend Sisters St. Croix, St. Laurent, Que., alterations to four houses, $31,000.

Recent building permits include: Jos. Demers, 475 Marquette street, two houses containing six dwellings and one store, $7,000; Ernest Latter, 18 Hospital, one house, $[illegible]; J. L. Meagher & Company, Pine avenue, one house, $19,000; Isaie Prefontaine, 107 St. James, one house, $15,000; C. Rosenberg, 4 Ontario east, two houses containing fourteen dwellings and one store, $15,000; C. C. Boucher, 138 Christophe Colombe, one house containing two dwellings, $6,000; Vincent Deschambault, 1818 St. Lawrence Boulevard, four houses containing eight dwellings and four stores, $[illegible]; Jos. Granda Cigar Company, one factory, $9,000; Viau & Duchesneau, 11 Drolet, one house containing five dwellings, $[illegible]; A. Leonard, 2171 St. Urbain, one house containing three dwellings, $5,000; Y. L. Giroux, 575 Dorchester east, one house containing two dwellings, $6,900; J. L. Cartier, 278 Notre Dame west, two houses containing six dwellings, $15,000; H. L. Timmons, N. A. Timmons, Atlas Construction Company, 747 St. Catherine west, one house and one factory, $62,000; Frank Scott, The Grosvenor, one house, $10,000; D. Tremblay, St. Catherine & Joliette, one house containing two dwellings and one store, $5,800; E. Clermont, 526 Alwyn, one house containing five dwellings, $3,600; J. Beaungk, 1584 Mance, one housa containing two dwellings, $3,400; Arthur Bastien, 849 Park avenue, four houses containing eleven dwellings and one store, $15,000; Jos. Riel, 1438 Demontigny, one house containing three dwellings, $4,800; Walter M. Lowney & Company, 165 William, one factory, $10,000; Ecole Commissioners Protestant, 197 Peel street, one house and one school, $90,000; H. Godin, 51 Esplanade, one house containing two dwellings and one store, $6,000; Bank Hochelaga, 272 St. Catherine west, alterations to house, $5,500; C. A. Dugas, 402 Dorchester, alterations to theatre, $3,000; Geo. W. Stephenson's Estate, 18 St. Alexis street, alterations to house, $3,500; Louis Dubeau, Dufferin, alterations to house, $2,000; G. H. Randall & Company, City Hall avenue, alterations to factory, $1,500; Miss M. L. Giguere, 285 St. Denis, alterations to house and store, $3,200; Oct. Mousseau, St. Hubert street, alterations to house and two dwellings, $1,450; Windsor Hotel, Dorchester street west, alterations to building, $3,150; A. L. Strachan, 167 Cadieux, alterations to house, $67,500; National Brewing Company, St. Paul and Dupre, alterations to brewery, $23,500.

Recent building permits include:—A. Piche, 1894 Sanguinet, house containing five dwellings, cost $3,500; O. Cardinal, 58 Rouville, house containing three dwellings, cost $6,500; O. Fournier, 125 Amherst, store and two dwellings, cost $5,000; A. Riopel, 2187a St. Urbain, two houses containing six dwellings, cost $6,000; F. Leduc Dame, 62 Agnes street, St. Henri, two houses containing six dwellings, cost $5,000; A. Janvice, 132 Cuvillier street, house containing three dwellings, cost $4,000; J. H. Dansereau, 425 Sherbrooke street east, house, cost $8,000; Dr. J. A. Fortier, 503 Rachel street, house containing three dwellings, cost $3,500; Hy. Blais, 364 Laurier, two houses containing six dwellings, cost $6,000; E. E. Wallace, 416 Guy street, house containing eight dwellings, cost $20,000; A. Bissonnet, 423 Davidson, one house containing four dwellings, cost $3,000; S. D. Vallieres, 1431 St. Hubert, apartment house containing fourteen dwellings, cost $15,000; G. Bayard, 27 Bagg, house containing three dwellings, cost $3,000; A. Gauthier, 1353 St. Hubert, two houses containing six dwellings, cost $7,500; A. Lacroix, 239 Christophe Colombe, one house containing three dwellings, cost $3,000; A. Leonard, 45 Casgrain, one house containing two dwellings, cost $2,500; G. Paquette, 122 Dagenais, one house containing three dwellings, cost $3,500; J. P. Forest, 243 Esplanade, two houses containing six dwellings, cost $7,500; J. P. Forest, 253 Esplanade, four houses containing twelve dwellings, cost $16,000; G. Galarneau, 192 Guy street, one house, cost $2,500; H. Pelletier, 661 St. Lawrence Boulevard, one house, cost $5,000; Dr. T. R. Wilson, 44 Park avenue, seven houses containing twenty-eight dwellings, cost $17,000; N. Nolin, 175a Park avenue, one house containing three dwellings, cost $4,000; J. Barsalon & Company, 222 Plessis street, stable, cost $10,000; J. St. Amand, 1975 St. Lawrence Boulevard, two dwellings, cost $10,000; N. Leclaire, 875 Sanguinet street, house containing seven dwellings, cost $21,000; M. Rodrique, 2 Beaudoin, house containing two dwellings and one store, cost $4,500; J. F. Brule, 151 St. Denis street, one house containing three dwellings, cost $5,000; M. Beauchamp, 869 Delorimiere avenue, house containing three dwellings, cost $4,000; A. E. Cousineau, 217 Hotel-de-ville, house containing five dwellings, cost $3,000; J. S. Prince, 500 Guy street, one apartment house containing twenty-eight dwellings, cost $35,000; J. S. Prince, 500 Guy, house containing eight dwellings, cost $12,000; N. Beauchamp, 1231 Bordeaux, one house containing three dwellings, cost $2,000; M. Deslauriers, 171a Christophe Colombe, two houses containing four dwellings, cost $3,000; I. Moquin, 55 St. Lawrence Boulevard, one house containing three dwellings, cost $6,000; A. Sageau, 667 St. Catherine east, two houses containing six dwellings, cost $11,000; B. Damiens, 898 Mount Royal avenue east, three houses containing six dwellings and three stores, cost $15,000; D. Cusson, 171 Parc Sir Georges, E. Cartier, one house containing six dwellings, cost $5,000; A. Beaudoin, 1846 Mance street, two houses containing six dwellings, cost $6,000; J. T. Lajoie, 1341a Chapleau street, two houses containing four dwellings, cost $2,700; Jos. Sawyer, 407 Guy street, house containing thirteen dwellings, cost $35,000; G. Derochers, 88 Bourbonniere, two houses containing six dwellings, cost $7,000; D. Charbonneau, 1846 Notre Dame west, house containing eight dwellings, cost $10,000.

Outremont, Que.

On May 4th a by-law will be voted on to issue $250,000 4 1-2 per cent. 42-years local improvement debentures. Geo. A. Robinson.

Ottawa, Ont.

Tenders are being called by Public Works Department until May 4th for dredging in Maritime Provinces.

Recent building permits include: Chas. Ropewell, concrete garage, Queen street, $12,000; Dr. C. H. Jewet, brick veneer dwelling, Monkland avenue, $4,000; A. Charpentier, row of five brick veneer dwellings, Main street, $5,500; E. N. Soper and J. W. Nimmo, brick veneer dwelling, Carling avenue, $5,000; Alexander and Campbell, brick veneer dwelling, Powell avenue, $6,000; James Low, brick veneer dwelling, Cooper street, $3,000; J. Connors, frame dwelling, Carlyle avenue, $2,750; W. O. Burns, double brck veneer dwelling, Arlington avenue, $2,800.
000.

The following are culled from supplementary estimates for year ending March 31, 1911: Chambly Canal—St. Johns' improvements, $20,000. Welland Canal—Surveys and borings for proposed new or enlarged canal, Port Colborne improvements, dock south of Welland, $140,500; to build new steel gate lifter, $12,000. Whitby, harbour improvements, $20,000. Annapolis harbour improvements, ice piers, additional amount, $15,000. Little Bras d'Or breakwater wharf, $10,000. North Sydney, deep water wharf, $8,000.

Quebec, Que.

The following is a list of contemplated public and private work to be constructed in this vicinity during the next five years: Bridge and approaches, $10,000,000; dry dock and ship building yards, 5,000,000; Grand Trunk Pacific terminals, $3,000,000; Quebec & Saguenay Railway, $3,000,000; Q. R. L. & P. Company's improvements, $1,500,000; custom house and other Government buildings, $1,000,000; harbor improvements, including extension Louise Dock, etc., $2,000,000; Canadian Pacific Hotel and Station extensions, $1,500,000; four thousand new houses at average cost of $2,000 each, $8,000,000; civic improvements in Limoilou, etc., including two bridges over St. Charles river, $500,000; Battlefields Commission. $1,000,000; total, $36,500,000.

Regina, Sask.

The following permits have been issued recently: S. Beach, residence, $2,800; Robt. Armour, block, $28,000; A. M. Fraser, residence, $6,000; Alex. Mowat, business block, $20,000; P. McAra, business block, $20,000; A. W. McGregor, building, $2,500; Robt. Ehman, dwelling, $3,100.

A. E. Chivers, city clerk, is calling for tenders until June 6th for 4 1-2 per cent. debentures for market building (30-year), $16,000); waterworks extensions (30-year), $10,000; sewer extensions (30-year), $10,000; agricultural industrial exhibition (20-year), $25,000; Albert street subway (30-year), $41,000. Total, $102,000.

Toronto, Ont.

Recent building permits include: D. A. Williams, one pair semi-detached two storey brick dwelings, Gladstone, $4,200; Geo. Nicholson, ten detached two storey and attic roughcast dwellings, brick fronts, Galt, $12,000; Mary S. Thompson, three storey brick store, office and dental room, corner Bloor and Clinton, $9,000; W. S. Hodgins, two and a half storey brick dwelling, Russell Hill road, $10,000; Dr. J. O. Orr, four attached two and a half storey brick dwellings, Horticultural Place, $10,000; H. S. Mara, two and a half storey brick dwelling, Rowanwood, $4,500; Mrs. S. Williamson, two detached two storey brick dwellings, Elmer, $4,000; G. A. McTaggart, one pair semi-detached two storey brick stores and dwellings, corner College and Sheridan, $6,000; A. O. Scott, one pair semi-detached two storey brick dwelling, Emerson, $4,000; A. Grassi, one pair semi-detached two storey brick stores and dwellings, Queen street west, $4,500; J. W. Brown, one pair semi-detached two storey brick dwellings, St. Clarens, $4,000; J. T. Robertson, two storey brick dwelling, on 42 Hayden street, $3,750; A. McGill, two detached two and a half storey brick dwellings, Humberside and Mavety, $6,000; J. Donagh, two storey and attic brick dwelling, Chestnut Park, $10,000; Mrs. Lane, two storey and attic frame addition to residence, Iroquois, $6,500; H. Shenhman, three attached two storey brick dwellings, Symington, $7,500; Dr. W. B. H. Aikens, alterations and additions to dwelling on Bloor, near Avenue road, $7,000; Geo. H. McLaughlin, one pair semi-detached two storey brick dwelings, Wroxeter, $3,500; W. H. Marks, three attached two storey brick dwellings, Margueretta, $6,000; Wm Lightle, two and a half storey brick dwelling, Castle Frank crescent, $5,000; J. S. Hedge, three pairs semi-detached two storey brick veneer dwellings, Weston and Morton road, $10,000; G. H. Webb, one pair semi-detached two storey and attic brick dwellings, Walter, $7,000; Hayes & Caldwell, three pairs semi-detached two storey roughcast dwelling, brick fronts, Dingwall, $8,000; Prof. J. H. Cameron, two and a half storey brick dwelling, Admiral, $4,500; R. Laidlaw & Company, three storey brick woodworking factory, corner Bridgman and Spadina road, $15,000; Sarah English, two pairs semi-detached two storey brick dwellings, Churchill, $10,000; J. O'Leary, one pair semi-detached two storey brick dwellings, Wallace, $4,000; G. Williams, four pairs semi-detached two storey brick dwellings, Brampton place, $10,000; M. Healy, three storey brick warehouse, 76-78 Richmond street east, $10,000; W. H. T. Stevens, three pairs semi-detached two storey brick dwelling, Salem, $10,500; C. A. Grant (in trust), one pair semi-detached two storey brick stores and dwellings, on 293-5 Broadview avenue, $4,500; D. Todd, one pair semi-detached two storey brick dwelling, St. Clarens avenue, $4,000; W. L. Larkin, 2 storey brick dwelling, north side Laburnam, $4,500; James Gibson, five detached two and a half storey brick dwellings, Lansdowne, $13,500; J. W. Young, three attached three storey brick stores and dwellings, Danforth, $11,000; Mrs. A. Rhodes, two storey brick dwelling, Keele street, $3,500; Waters & Elliott, six pairs semi-detached two storey brick dwellings, Yarmouth Gardens, north side, $30,000; A. Cross, three attached two and a half storey brick dwellings, College, $7,500; A. J. Savage, two storey brick dwelling, East Roxboro, $6,500; J. & T. Bishop, two detached and one pair semi-detached two and a half storey brick dwellings, Hepbourne and Havelock, $12,000; L. J. Bland, two pairs semi-detached two storey brick dwellings, Dupont, $8,000; R. Ranaldo, one pair semi-detached two storey and attic brick dwellings, 100-102 Curzon, $4,300; W. B. Charlton, three storey brick apartments (2), southeast corner Homewood and Wellesley, $20,000; J. F. Murray, two storey brick dwelling, 46 Eleanor street, $3,500; Mrs. E. Piper, two storey and attic brick dwelling, 86 Admiral road, $6,500; W. H. Holmes, one pair semi-detached two storey and attic brick dwellings, St. Clair, $5,800; J. H. Simpson, two storey and attic brick dwelling, Gladstone, $6,000; A. Bryce, two and a half storey brick dwelling, Russell Hill road, $6,000; Standard Sanitary Manufacturing Company, Limited, three storey brick, steel and concrete factory on Royce and Lansdowne, $15,000.

Victoria, B.C.

The ratepayers will vote at an early date on a $65,000 road improvement by-law.

Vancouver, B.C.

Building permits were granted as follows: Haida Confectionery Company, brick Coleman, [illegible] street, four houses, $9,000; Jefferson & Clapham, 1637 Maple street, $2,000; H Labrash, Eleventh avenue, $3,500; James [illegible], [illegible] Thirteenth avenue, $1,800; V. Braithwaite & Glass, 1874 Seventh avenue west, four houses, $4,000; J. Bentley, 1828 Sixth avenue, $5,000; Fred Melton, 1581 Twelfth avenue, $4,000; C. Farmer, five dwellings, 2138 Victoria drive, [illegible]; R. J. [illegible], [illegible] Hastings street east, $2,000.

Recent building permits include:—D. Caldwell, frame dwelling, 1665 Twelfth avenue west, $4,000; Wilkinson & Son, frame dwelling, Seventh avenue east, $[illegible],500; James Dickie, 1455 Seventh avenue, two storey frame house, [illegible]; B. C. Bedding & Upholstering Company, Frank street, brick warehouse, $25,000; Mrs. Edith Johnston, 1226 Richards, frame addition, $3,300; A. Hailey, 3523 First avenue, storey and a half frame house, $3,190 C. P. R., 2030 Whyte street, $5400; C. P. R., 1626 Eleventh avenue east, $9,321 A. Baxter, frame bungalow, Thirteenth avenue, $3,682; H. J. Monroe, frame house on Thirteenth avenue, $3,000; J. Pierce, 2332 Burns street, $6,400; Prudential Building Company, $3,000; R. O. Boult, 536 Thirteenth avenue west, $3,000; H. L. Munro, 305 Thirteenth avenue west, $3,682.

Winnipeg, Man.

Recent building permits include: Moss & Hutton Company dwelling on Lipton, $2,000; Copping Bros., dwelling, Home street, $5,500; A. L. Bond, six dwellings, Rosedale avenue, $12,000; B. Persichini, additional storeys, north side of Portage avenue, $22,000; T. Olson, dwelling, Broadway and Assiniboine, $10,000; Sherwin Vincent, two dwellings, Morley avenue, $2,800; Boyle Higgins, dwelling, Nassau, $2,500; J. Isenberg, dwelling, Cathedral, $4,000; J. Isenberg, dwelling, Aikins, $4,000; H. Galbraith, dwelling, Basswood street, $5,000; Andrews & Sons, dwelling, Canora street, $4,800; A. C. Galbraith, west side Banning, $2,000; F. D. Burriss (2) south side Beresford, $5,000; W. A. Cameron, east side Arlington, $4,000; Dunn & Wallace, north isde Yale, between Wilton and Rockwood, $7,000; P. Lakustor, north side Magnus, $2,500; J. Atkinson, north side Hart, $2,000; C. Wigert, No. 386 Jasper $2,800; J. T. Bergman, west side Alverstone, $2,800; A. C. Galbraith, (3) west side Basswood, $6,000; J. C. McNab, (double) south side Alfred, $5,000; John Matthews, south side Arnold, $2,000; J. B. Lauzon, dwelling, 95 Athole street, $2,000; R. Cohen, dwelling, Selkirk, $3,000; A. McFarland, dwelling, corner of Garfield and Livinia, $[illegible],800; L. Armstrong, dwelling, Hetherington, $2,000.

Recent building permits include: J. B. Duncan, house, Grosvenor, $4,000; Thomas Jackson & Son, house, Ruby, $3,200; John Saul, house, Harvard, $10,000; J. Dodds, dwelling, west side Young street, $2,500; Ripstein & Company, addition to 606 Main street, $9,000; S. Brown, dwelling, north side Preston, $5,000; H. W. Eaton, dwelling, east side of Centennial street, $2,600; G. O. Aulsebrook, dwelling, Maryland, $4,500; G. F. Stephens, dwelling, 3 Wilmot place, cell, between Maryland and Walnut, $4,000; D. James, west side Walnut, $3,600; Moss-Hutton Company, four houses, one on Athol, between Mae and Scotia, two on east side Lipton, between Portage and Livinia, and one on Boyd between Charles and Aikns, total cost $11,400; C. D. Stovel, dwelling, Ruskin Row, opposite Yale street, $22,000; J. C. McNab, 2 dwellings, Alexander avenue, $2,000; T. Crowe, dwelling, Rosedale avenue, $2,500; R. James, 3 dwellings, Home street, $8,400; A. C. Galbraith, Newman street, eleven dwellings, $23,100; G. W. Ford, three houses, west side Chestnut, between Preston and Buell, $14,500; J. C. Hicks, apartment block, southwest corner of Helen and McMillan, $12,000; O. Storseter, house, west side Home, $2,500; J. A. Martin, house, west side Eethelbert, $5,000; J. A. Martin, two houses, east side Canora, $10,000; H. M. Patterson, dwelling, east side of Agnes, $2,000; E. M. Wood, dwelling, south side of Roslyn road, $11,000; H. Galbraith, dwelling, east side of Banning, $5,000; J. Fowlie, annex to Brunswick hotel, east side of Main street $22,000; J. H. Laplante, dwelling, west side of Arlington, $6,000; P. McDiarmid, two

(Continued on page 29)

Tenders and For Sale Department

Town of Kingsville

Debentures for Sale

[illegible] 18

Notice to Contractors

[illegible] will be received up to 3 o'clock p.m. on THURSDAY, [illegible] 80 cubic yards, for a steel bridge [illegible] Onondaga Station, G. T. R., and the same [illegible]nce from the Village of Middleport.

[illegible] of the [illegible]ncrete.

Contract will be awarded then if satisfactory.

S. J. McKELVEY,
Township Clerk,
19 Tuscarora P.O,, Ont.
19

Tenders for Bridges

Tenders will be received by Geo. K. Dewey, Town Clerk, Brockville, Ont., up to twelve [illegible] WEDNESDAY, MAY 11TH, [illegible], for the construction of six bridges in the Town of Brockville, including concrete or stone masonry abutments and steel beam or reinforced concrete superstructures.

Plans and specifications may be seen and all necessary information may be obtained at the office of the Town Clerk, Brockville, Ont., or at the offices of Barber and Young, consulting engineers, 57 Adelaide street east, Toronto.

The lowest or any tender not necessarily [illegible]

S. GOWAN,
Chairman of the Board of Works.
Brockville, April 27th, 1910. 18

To Contractors

Sealed tenders, endorsed "Tender for Addition to Osgoode Hall," addressed to the undersigned, will be received up to noon of SATURDAY, MAY 14TH, for the erection of an addition to Osgoode Hall, Toronto, for all trades excepting Heating, Plumbing and Electric Lighting. Plans and specifications can be seen at this Department.

An accepted bank cheque, payable to the order of the Hon. J. O. Reaume, Minister of Public Works, for 5 per cent. of the amount of the tender and the bona fide signatures and addresses of two sureties, or the bond of a guarantee company, approved of by this Department, must accompany each tender.

The Department will not be bound to accept the lowest or any tender.

By order.

H. F. McNAUGHTEN,
Secretary Public Works Dept.

Department of Public Works, Ontario,
Toronto, April 28th, 1910.

Newspapers publishing this advertisement without authority will not be paid for it. 18

Tenders for

Concrete Bridge and Floor

Tenders will be received up to the hour of letting at 2 p.m. on TUESDAY, MAY 19TH NEXT, for (1) 35 Feet Concrete Arch, near New Dundee; (2) Concrete Floor on Bridge, near Ayr, according to plans prepared by Bowman and Connor, civil engineers. For further information apply to F. Vickert, Esq., Princeton, or to

HERBERT J. BOWMAN, C.E.,
19 County Clerk, Berlin.

Notice to Contractors

Sealed tenders, marked, will be received by the Town Clerk up to 5 o'clock p.m. on MONDAY, 9TH MAY, 1910, for the building of a brick Town Hall.

Plans and specifications may be seen at the Clerk's office.
parts thereof.
Tenders may be for the whole works or for

A certified cheque to the amount of ten per cent. thereof, payable to the order of the Town Treasurer, must accompany each tender.

Lowest or any tender not necessarily accepted.

J. C. ECKFORD,
18 Town Clerk.

Tenders Wanted

Sealed tenders, marked "Tender for Six-room or Ten-room School," as the case may be, for the separate trades or for the whole contract, will be received by the Board of Education, Lindsay, Ont., up to the SIXTEENTH DAY OF MAY, 1910. Plans and specifications and all information may be obtained from the Town Clerk's office, Lindsay, and also from the office of Architects Ellis and Connery, Manning Chambers, Toronto. No tender necessarily accepted.

Tenderers may name a price to be allowed for the materials in the old Central and North Ward School, to be removed after the completion of the new building.

ROBERT SPIER,
Secretary Board of Education,
18 Lindsay, Ont.

City of Vancouver

Tenders for

Garbage Destructor Plant

Tenders will be received by the undersigned up to 3.00 p.m., TUESDAY, THE 31ST OF MAY, 1910, for the installation of a Garbage Destructor Plant at the Bridge street yard, on the south side of False Creek in the City of Vancouver, British Columbia. The plant must be capable of destroying not less than seventy tons of mixed garbage per day of twenty-four hours.

Tenderers will be required to submit plans and specifications with their proposals and furnish a satisfactory bond and guarantee that the destructor will fulfill all the provisions of the specifications.

The tendered price is to include the erection of the stack and all necessary buildings.

A deposit of an amount equal to 5 per cent. of the contract price must be made with each tender by marked cheque payable to the City Treasurer.

The lowest or any tenders not necessarily accepted.

W. McQUEEN,
19 City Clerk.

Town of Fort Frances

Sealed tenders will be received by the Corporation of the Town of Fort Frances, addressed to W. H. Elliott, Clerk of Fort Frances, Ont., until 8 o'clock p.m., on THURSDAY, THE 26TH DAY OF MAY, 1910, for the construction and completion of the following contracts in the extension of the sewerage system of the said Town of Fort Frances, viz.:

"A." All labor for the construction of the extension to the sewerage system, and certain materials therefor.

"B." The supplying of vitrified tile pipe and junctions.

"C." The supplying of cast iron manhole covers, catch basin covers, and flap valves.

Copies of plans and specifications and forms of tender may be had upon application to the undersigned, the Clerk of Fort Frances.

H. WILLIAMS, W. H. ELLIOTT,
Mayor. Town Clerk.
Fort Frances, April 21st, 1910. 19

Intercolonial Railway Tender

Sealed tenders addressed to the undersigned, and marked on the outside, "Tender, Railway Nelson to Chatham," will be received up to and including TUESDAY, MAY 10TH, 1910, for the construction of a line of railway between Nelson and Chatham (N.B.), a distance of about 8.28 miles.

Plans and specifications may be seen at the Station Master's Office, Chatham (N.B.), at the Chief Engineer's Office, Moncton (N.B.), and at the office of the Secretary of the Department of Railways and Canals, Ottawa (Ont.), where forms of tender may be obtained.

All the conditions of the specification must be complied with.

A. W. CAMPBELL,
Chairman.
Government Railways Managing Board,
Ottawa, Ont., April 12th, 1910. 18

City of Winnipeg

Tenders for

Construction of Brown and Brant Street Overhead Bridge

Sealed tenders, addressed to the Chairman, Board of Control, Winnipeg, and marked on the envelope, "Tenders for Brown and Brant Street Bridge," will be received at the office of the undersigned up to 11 o'clock a.m., on TUESDAY, JUNE 28TH, 1910, for the following works:—

(a) Construction of Concrete Piers, to be completed on or before the fifteenth day of November, 1910,

(b) Erection of Steel Superstructure and floors, with two lines of street railway tracks, to be completed on or before the first day of June, 1911.

Plans, specifications and forms of tender, together with conditions governing tenders as prescribed by by-law, may be obtained at the office of the City Engineer, Winnipeg. The lowest or any tender not necessarily accepted.

M. PETERSON,
Secretary.
Office of the Board of Control,
Winnipeg, April 30th, 1910. 19

Town of Walkerville

Tenders for

Pavement and Sewer

Sealed tenders will be received by registered post, addressed to the undersigned up to noon on TUESDAY, THE 17TH MAY, 1910, for the construction of a Concrete Pavement on Monmouth road, from Ontario street to Ottawa street; also of a Cedar Block Pavement in a concrete foundation on Monmouth road and Ottawa street.

Also for the construction of a Brick Sewer in Argyle road, Ottawa street, and along the southerly side of the Grand Coulie ditch to the east limit of the town, in the Town of Walkerville.

Plans and specifications may be seen on application to Mr. Owen McKay, C.E., Walkerville.

Tenders must be accompanied by a marked cheque, made payable to the Town Treasurer, equal to 5 per cent. of the amount thereof.

Should any party whose tender is accepted fail to execute the necessary contract and bond for the due fulfilment of the same, his deposit will be forfeited to the town.

Deposits of unsuccessful tenderers will be returned.

The lowest tender not necessarily accepted.

The names of the two responsible persons willing to act as sureties must accompany each tender.

CECIL H. ROBINSON,
Town Clerk, Walkerville.

Walkerville, April 30, 1910. 18

Temiskaming and Northern Ontario Railway Commission

Sealed tenders addressed to the undersigned will be received up to noon, MAY 11TH, for the following works:

(A) Construction of three revised standard sectionmen's houses at Gillies Depot, Uno Park, and Charlton. Tenders to be marked on envelope, "Tender for Sectionmen's Houses," and to be accompanied by certified cheque on chartred bank of Canada for the sum of five hundred dollars ($500).

(B) Construction of one or more standard sectionmen's houses for bachelors, situated along the line of the T, and N. O. Railway, between North Bay and Cochrane, tenders to be marked on envelope, "Tenders for Sectionmen's Houses for Bachelors," and to be accompanied by certified cheque on chartered bank of Canada for the sum of one hundred and fifty dollars ($150).

Plans and specifications may be seen and forms of tender obtained at the office of the secretary-treasurer, 25 Toronto street, Toronto, and at the office of the chief engineer, North Bay.

The lowest or any tender not necessarily accepted.

A. J. McGEE,
Secretary-Treasurer.

Papers inserting this advertisement without authority will not be paid for it.

25 Toronto street, Toronto, April 22nd, 1910. 18

Positions Vacant

Advertisements under this heading two cents a word per insertion.

WANTED—First class general foreman or superintendent by a firm of general contractors with head office in Winnipeg, Manitoba. Must understand all kinds of construction machinery and be able to handle all kinds of concrete work, coffer dams, etc. A steady position for the right may. State salary expected and give references. Address Box 969 "Contract Record," Toronto. 18

Positions Wanted

Advertisements under this heading, one cent a word per insertion. Box No. ten cents extra.

QUARRY MANAGER, ENGINEER, 32, at present in charge of marble quarry and works, accustomed to preparing for the market, building and decorative stores, wishes modest appointment, would consider partnership in small quarry. Apply "Scott," care Street's Agency, 30 Cornhill, London, England. 18

Miscellaneous

Advertisements under this heading two cents a word per insertion.

FOR SALE.—Van Kannel Revolving Door and Post Office Fixtures at half price. Apply to H. Weller, Welland, Ont. 18

FOR SALE—Eighty-eight (88) pieces of Lackawanna Steel Sheet Piling, twenty-two (22) feet long, twelve and three-quarter (12¾) inches wide, three-eighths (⅜) inch thick, WM. LESSLIE, Walkerville, Ont.

AGENTS WANTED—United States manufacturers of a well-known waterproofing compound wish to get in touch with reliable firm or individual to represent them in Canada. This would be a desirable opportunity for an energetic young architect or engineer. Box 970 "Contract Record." 20

Miscellaneous

(Continued from page 27)

dwellings, north side of McMillan, $3,250; B. Radford, north side of Wellington crescent, apartment block, $75,000; L. Overdale, dwelling, west side of Ruby street, $3,000; E. Bremner, dwelling, east side of Telfer, $5,600; J. C. McNab, dwelling, west side Ruby, $3,200.

AWARDED.

Calgary, Alta.

Geo. H. Archibald & Company, of Winnipeg, have been given the contract for labor required by the Canadian Pacific Railway in the completion of the western section of their irrigation system, which involves upwards of 2,500 cubic yards of reinforced concrete and much excavation and backfill work.

Cornwall, Ont.

The contract for the improvement of the north bank of the Cornwall canal above Lock 17 has been awarded to Fallon Bros., Cornwall. Price, about $70,000.

Halifax, N.S.

Following is a list of tenders received for supplies for 1910-1911: Bricks, per 1,000, Rhodes, Curry & Company, $8.40 at I. C. R. depot; $8.55 at Cotton Factory siding ($1 less for run of kiln; $8 for hand picked; Eastern Portland Cement Company, $7.20 at depot; $7.30 at siding; A. Gunn & Company, $8 at depot, $8.35 at siding; General Contractors' Supply Company, $7.10 at depot, $7.30 at siding; J. Simmonds & Company, $7.05 at depot, $7.25 at siding; Simmonds & Company's was accepted. Cements: Eastern Portland Cement Company, [illegible] 3-4 cents per cwt. net; ; Brookfield Bros., 40 3-4 cents; Stairs, Son & Morrow (barrels), 51.04 and 52.94 cents per cwt.; Sydney Cement Company, 41 cents; Rhodes, Curry & Company, Limited, (barrels), 50 cents per cwt.; Musgrave & Company, 48 3-4 cents. The tender of Brookfield Bros. was accepted. [illegible]—Guildford & Company, [illegible] cents, [illegible] cents, 3-4 [illegible] cents; McAvity & Son, 75 cents and $1.05; James Robertson & Company, 72 cents and 80 cents. Guildford & Company accepted if specifications are complied with. Drain pipe Rhodes, Curry & Company, Limited, [illegible]

field Bros., Black & Flinn, Eastern Portland Cement Company.

Ottawa, Ont.

Contracts totalling about $300,000 for dredging in Ontario have been awarded by the Government. The prices vary from 9 1-2 to 29 cents per cubic yard, and the successful bids are the following:—For dredging at Byng Inlet, Manley & Company, Toronto; Cobourg, Randolph MacDonald Company, Toronto; Goderich, William L. Horton, Toronto; Kincardine and Port Elgin, the Dredging & Drainage Company, Toronto; Owen Sound, W. E. Phin, Welland; Port Burwell, General Construction & Dredging Company, Toronto; Port Hope and Whitby, W. E. Phin, Welland; Rondeau, Windsor Dredging Company. Contracts for dredging in Quebec Province totally $200,000 have been awarded. The biggest job is at Quebec, amounting to $60,000. The successful bidders are: For Quebec Harbor, Dominion Dredging Company, 24 1-2 cents per cubic yard; St. Maurice river, at St. Pierre, 15 cents; Beauharnois, H. M. Conley, 20 cents; Berthierville, L. Cohen and Son, 16 cents; Batiscan, Dufresne & Marchildon, 20 cents; Riviere du Loup, W. J. Poupore, 20 cents; Yamaska river, W. J. Poupore, 18 cents; Valleyfield, General Construction Company, 21 1-2 cents.

Vancouver, B.C.

The following tender for four auto hose wagons and auto chemical engines was accepted; W. H. Seagrave, $25,983.

Business Notes

A. Levesque, Montreal, Que., contractor, has assigned.

Simpson & Lailey, builders, Winnipeg, Man., have dissolved.

Stevens & Coutu, Dunham, Que., contractors, have registered.

A. K. VanWyck, Park Hill, Ont., have advertised their business for sale.

R. A. Wesley & Company, contractors, Killarney, Ont., are stated to have assigned.

The Pacific Coast Lumber Mills, Limited, sold mill and stock to British Canadian Lumber Company, Limited.

Summerland Fruit Company, Limited, Summerland, B.C., have sold their lumber stock to Wm. Ritchie, and their sawmill to Campbell Bros.

P. A. Mackle & Son, woodworkers, Toronto, Ont., have assigned to N. L. Martin.

Peppard & Cairnie & Company, contractors, Montreal, Que., have dissolved.

The B. C. Gazette gives notice of the incorporation of the following companies:—G. E. Gibson Company, Limited, capital $50,000, incorporated to carry on the business of contractors and builders; the British Columbia Ceiling & Roofing Company, Limited, capital $150,000; the Port Mellon Development Company, Limited, capital $125,000, incorporated to build flumes, tramways and the development of electrical power, etc.; Peace River Lands Company, Limited, capital $25,000, incorporated to construct, operate, etc., electric works, power houses, generating plants; Atlin Construction Company, Limited, capital [illegible]; the H. E. [illegible] Company, Limited, capital $25,000, incorporated to carry on the general business of [illegible] dealers in all kinds of machinery, saw mill [illegible] & Company, engineers, capital [illegible] & Trading Company, Limited, capital [illegible],000.

New Companies

Northern Automobile Company, Limited, Fort William, Ont., capital $[illegible]. Incorporators, Edward Dunlop Higginbottom, plumber, and Lorne [illegible] Innes, manager of [illegible] company, both of Fort William.

Canadian [illegible] Company, Limited, Toronto, Ont., capital $[illegible]. Incorporated to carry on the business of general contractors. Incorporators, Lionel Davis and Mr. Edgar McCann, barristers at law, Toronto, Ont.

The Ontario Motor Car Company, Limited, Toronto, Ont., capital $100,000. Incorporators, Robert Benjamin Henderson, barrister at law, and James Cooper Royce, consulting engineer, both of Toronto, Ont.

Charles Jarrott & Letts, Limited, Toronto, Ont., capital $50,000, incorporated to manufacture and deal in motor cars, etc. Incorporators, John Ingram Sutcliffe, chartered accountant, and Albert Henry Winter Joyner, engineer, both of Toronto.

The Foundation Company, Limited, Montreal, Que., capital $50,000. Incorporators, Franklin Remington, contractor, and Louis Livingston Brown, engineer, both of New York, N.Y.

The Burroughs Falls Power Company, Limited, Ayer's Cliff, Que., capital $50,-0000. Incorporators, William Brault, manufacturer, Sherbrooke, Que., and William Gay Libby, lumber manufacturer, Ayer's Cliff, Que.

The Laurentian Chemical Company, Limited, Montreal, Que., capital $590,000. Incorporated to manufacture wood alcohol, etc., and to buy timber and lumber.

Seller's Anchor Bottom Tie Plate Company of Canada, Limited, Montreal, Que., capital $100,000. Incorporated to deal in tie plates, railway supplies and all sorts of iron and steel. Incorporators, Robert Jewett Mercer, merchant, and Samuel William Jacobs, K.C., both of Montreal.

La Compagnie P. P. Giguere, Limited, Quebec, Que., capital $20,000, incorporated to carry on the business of plumbers, installers of steam heating apparatus, electricity, etc. Incorporators, Joseph Letarte, acountant, and Alexander Giguere, electrician, both of Quebec, Que.

William McWilliam, Incorporated, Quebec, Que., capital $40,000, incorporated to manufacture and produce steam, gas, light and power. Incorporators, Wm. Leopold McWilliam, Alfred Lyell McWilliam, confectioners, and Chas. Claude McWilliam, clerk of City of Quebec, all of Quebec, Que.

Paradis & Boisvert, Incorporated ,Montreal Que., capital $20,000, incorporated to erect and construct workshops or other works, with the machinery necessary to carry on the said trade and industry. Incorporators, Chas. M. Cotton, advocate, Montreal, and Herbert A. Webb, printer, Covansville, Que.

The Dredging & Drainage Company, of Ontario, Limited, Toronto, Ont., incorporated, capital $50,000. Incorporators, J. E. Russell, contractor, C. W. Thompson, E. W. Wright and Irving Stuart Fairty, barristers at law, all of Toronto.

LeBel-Turnbull Lumber Company, Limited, Sarnia, Ont., incorporated, capital $401,000. Incorporators, E. A. LeBel, H. Turnbull, lumber dealers, and A. Steves Burnham, barrister, all of Sarnia.

The Rodney Woodenware Company, Limited, Rodney, Ont., incorporated, capital $15,000. Incorporators, J. J. Mistele and G. R. Whitton, merchants, L. Miller, wood merchant, all of Rodney, Ont.

International Paving & Construction Company Limited, Montreal Que., capital $10,000. Incorporators, Frank Henry Norman and Chas. Wlliam Norman, professors, Montreal, Que.

C. Robillard & Company, Limited, Montreal, Que., capital $75,000, incorporators, Clement Robillard, manufacturer, and Alphone Robillard, accountant, both of Montreal. Incorporated to construct, erect buildings, factories, etc.

The Transportation Building Company, Limited, Montreal, Que., capital $750,000. Incorporators, Francis A. Brodie, bank manager, and Arnold Wainwright, advocate, both of Montreal, Que.

La Compagnie de Briques de Quebec, Limitee, Quebec, Que., incorporated, capital $60,000. Incorporators, Louis-Eugene De Villers, accountant, and Edouard Nadeau, contractor, both of Quebec, Que.

The William Rutherford & Sons Company, Quebes, Que., capital, $60,000, incorporated to carry on the business of manufacturers and dealers in lumber, wood, timber, etc.

La Compagnie Electrique de Deschambault, Quebec, Que., capital $145,000. Incorporators, Joseph Elzear Voisard, physician, Saint-Marc des Carriers, and Joseph Henri Pare, accountant, of Quebec, Que.

The Brown, Jarvis Roofing Company, Limited, Brantford, Ont., incorporated, capital $50,000. Incorporators, G. W. Brown, G. Jarvis and F. Jarvis, slaters, all of Brantford, Ont.

The Edwards, Reesor Company, Limited, Toronto, incorporated to manufacture, install, etc., boilers, sheet metal work, plumbing, etc. Incorporators, A. B. Reesor and G. E. Edwards, manufacturers, both of Toronto.

Bermuda Trolley Company, Limited, Toronto, Ont., incorporated, capital $100,000. Incorporators, J. S. Lovelle, accountant, W. Bain, bookkeeper, and R. Gowans, all of Toronto.

Clarke & Monds, Limited, Toronto, Ont., capital $40,000, incorporated to carry on a general engineering and contracting business in sewers, concrete works, etc. Incorporators, W. Monds, E. R. Clarke and J. H. McKnight, contractors, all of Toronto.

Knight Bros. & McKinnon, Limited, Cobalt, Ont., incorporated to deal in building material, such as brick, cement, etc. Capital, $50,000. Incorporators, Malcolm McKinnon, lumberman, and Thos. McCauley, accountant, both of Cobalt, Ont.

Excelsior, Limited, Toronto, Ont., capital $150,000; incorporated to carry on the business of manufacturers of wood fibre, lumber, etc. Incorporators: J. A. Manning, Owen Sound, traveller, and G. Howard, operator, Toronto.

Positive Clutch and Pulley Works, Limited, Toronto, Ont., incorporated, capital $50,000. Incorporators: E. W. J. Owens and W. A. Proudfoot, barristers, Toronto.

The Central Land and Building Company, Limited incorporated, capital $40,-000. Incorporators: A. A. Mathews, builder, J. L. Sharkey, manufacturer, and F. S. Morrison, accountant, all of Hamilton, Ont.

Schumacher Brick & Tile Company, Limited, Toronto, Ont., incorporated, capital $100,000. Incorporators: A. W. Holmested and J. Leith Ross, barristers, Toronto.

The Ball Planing Mill Company, Limited, Barrie, Ont., incorporated, capital $75,000. Incorporators: W. Gallie, J. Dinwoody Rodgers and Thomas Gray, contractors, and G. Rodgers, carpenter, all of Barrie, Ont.

Canadian Mahogany Company, Limited, Ottawa, Ont., capital $200,000, incorporated to carry on the business of saw millers, planing, etc. Incorporators: Hon. W. C. Edwards, G. C. Edwards, lumbermen, Ottawa; W. A. Hall, City of New York, U. S. A., manufacturer, and W. B. Chisholm, Charleston, Cal., manufacturer.

The Robinson Glue Company, Limited, Montreal, Que., incorporated, capital, $75,-000. Incorporators, J. G. DeLormier, E. H. Godin, advocates; G. W. Dow and W. B. Converse, bankers, all of Montreal.

Frank Lime Company, Toronto, Ont., capital $50,000, incorporated to manufacture and deal in all kinds of cement. Incorporators: O. Mowat Moore and John McBain, manager, both of Toronto.

The Wabi Iron Works, Limited, New Liskeard, Ont., capital, $40,000, incorporated, F. L. Hutchinson, A. V. Summers, both of New Liskeard.

British Empire Timber Co., Limited, Montreal, Que., capital, $1,500,000. Incorjorators, G. Vipond Cousins, accountant, P. F. Brown, both of Montreal.

The Niagara Falls, Welland & Dunnville Electric Railway has been incorporated with capital stock, $200,000. The provisional directors are: J. G. Gardner, Geo. Arnold, F. E. Misener, G. H. Burgar H. A. Rose.

A New Mixture for Prevention of Dust

In England some county authorities are trying a new process of preventing dust on roads, which, it is claimed, will last three years, and the county engineer states that he knows of cases nearly of that age and still good. There is no tar or oil in the composition, and it can be laid for four cents per square yard. It can be applied in any weather and never gets slippery. It is also claimed that after a year's time the use of tar injures the road and causes the surface to deteriorate.

We notice from our exchanges that new compositions are constantly being tried, and up to date not one seems to be wholly satisfactory. As in the clipping quoted above, tar is complained of as injuring the road. Others, again, contain substances that when used, the washing of the roads into water courses is very injurious to trees and vegetation. And it may be said that in all cases it is a costly process. However, we may live in hopes that sometime we may discover a method that will answer the purpose, and not bankrupt the neighborhoods where used. Very probably it will come by improving our road building.

Mitchell, Zephirin & Company, builders, Point Claire, Que., Origene Mitchell registered.

The B. C. Gazette gives notice of the incorporation of the following companies: Fort George Supply Company, Limited, capital $50,000, incorporated to carry on business as lumbermen, sawmill men and dealers in lumber, shingles, etc.; Standard Glass Company, Limited, capital $25,000, incorporated to deal in paints, oils, plate, sheet and ornamental glass, etc.; Slocan Lake Lumber Company, Limited, capital $100,000; the Port Haney Waterworks Company, Limited, capital $10,000; Ward Electric Company, Limited, capital $10,-000; the Sullivan Fireproof Wall & Partition Company of Canada, Limited, capital $40,000; G. E. Gibson Company, Limited, capital $50,000, incorporated to carry on the business of contractors, builders and dealers in all kinds of machinery and supplies; the Shortreed Shingle Company, Limited, capital $10,000; the McLelan Lumber Company, Limited, capital $50,-000.

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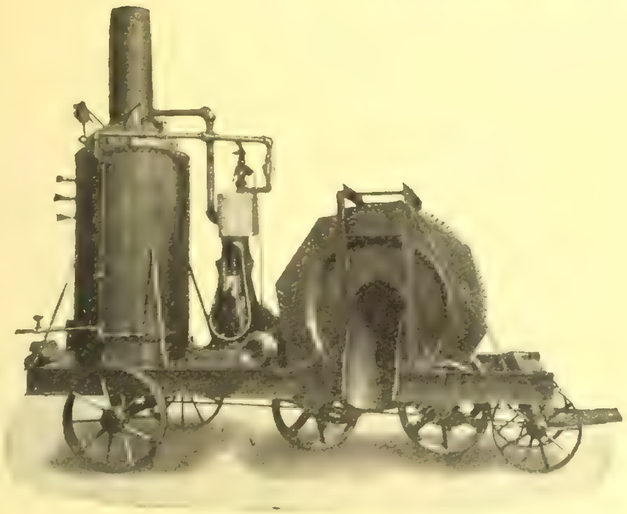

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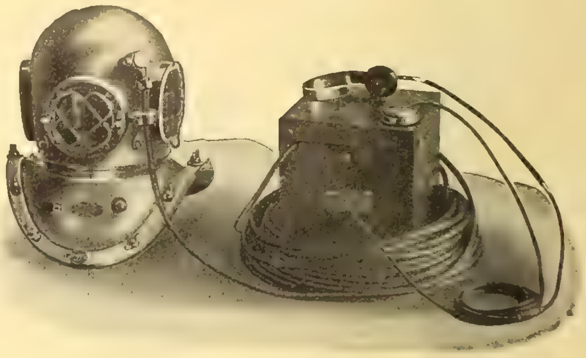

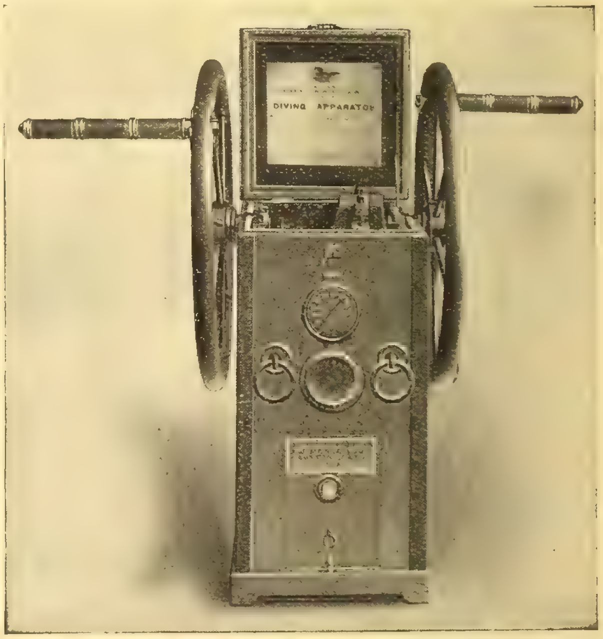

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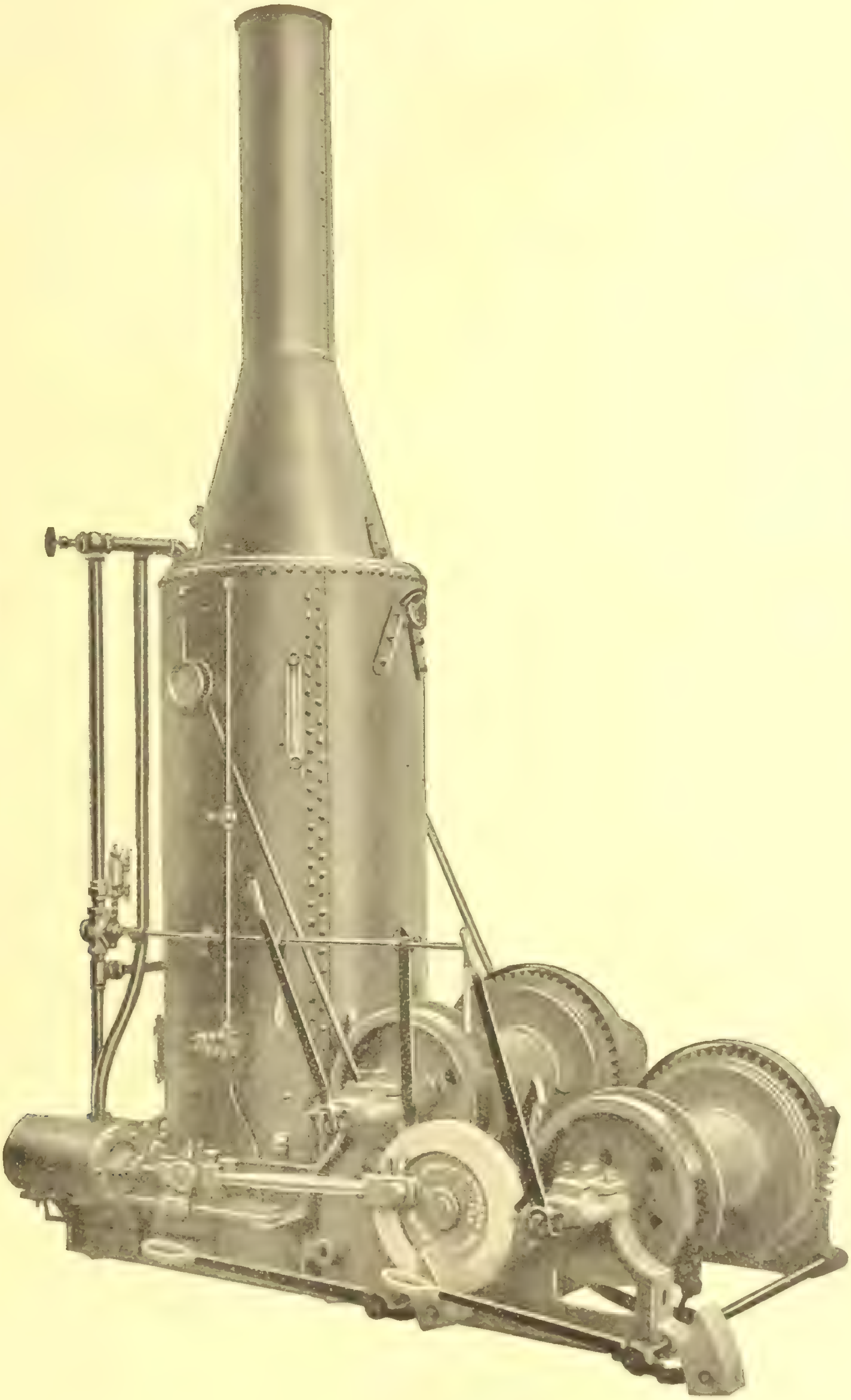

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Prompt Settlement with Contractors

A good percentage of the Toronto contracting community should feel grateful to City Engineer Rust for his action in bringing to the attention of the Committee of Works the hardships of contractors operating with a limited capital. During the greater part of the year all progress estimates issued to contractors after passing through the Works Committee have to pass the Board of Control and council, and frequently it takes between three and four weeks for the city treasurer to pay over the money to the contractor. During the summer months these progress estimates are paid immediately upon passing the Board of Control, and, as Mr. Rust pointed out, this system should be enforced throughout the year. If this were accomplished the reformed method would not only reflect better business on the part of the authorities but would also be a material advantage to contractors of comparatively small capital. It does not take very long to get a great deal of money tied up in the contracting business and it would seem that the civic authorities at any rate should set a good example in regard to prompt settlement.

A Word in Season

It is better to be less exacting in the matter of taking and completing a contract, because there will be occasions that may be the means of securing further business if there is policy used by the contractor. It is not to be presumed that the contractor must be imposed upon, and that he should do things that are in themselves costly to him, but there is a line between this stand and that of permitting your customers to exact conditions of you that will mean your loss. There are so many times when the matter can be adjusted to the satisfaction of all parties that it would be well to bear in mind the importance of arranging in advance, so far as it is possible to do, the exact terms of a contract, and the stipulated price of such extras as are almost sure to come with every contracting job, even though it be a minor undertaking.

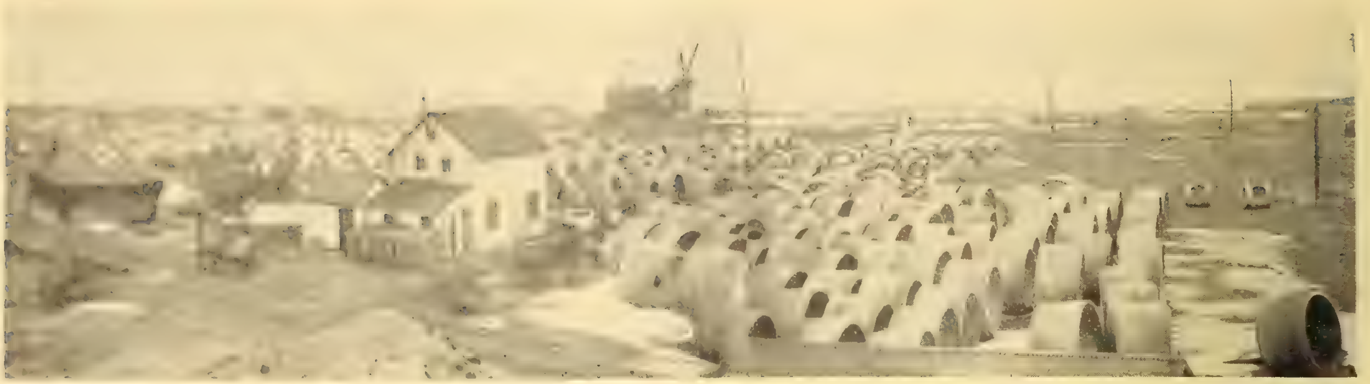
Inform Architects of New Goods

There is nothing that will help those manufacturers who specialize in fancy and other high grade face brick so much as to keep all their different products conspicuously before the minds of the architects who have in hand work likely to involve the use of such brick, and the same, of course, applies to terra cotta and other clay products for use in such structures that call for architects. The architects that are worth while are not only wide awake, but they are seeking all the time for different effects and new things in face and color, for improved ideas in products that will help in fireproofing, or in any other of the problems that are confronting the architects from time to time. A good architect is also a busy man, and, while you may have placed before him at some time a full line of products, do not take it for granted that he is going to keep this in mind all the time. There are lots of other people offering things to the architect. There are many other things before his mind besides your own product. So, if you get the attention your offerings deserve, you must see that they are kept before the eyes of the architects more or less continuously, not offensively or intrudingly, but invitingly. Do not rest secure in your imagination on the fact that you sent samples of brick to some architect last year or year before, or sent a pamphlet neatly illustrating the full line, but keep after them again this season and every other season. In some lines of manufacture, it is found to pay well to maintain what is called a staff of detail men who exploit the company's goods, but particularly the newer articles, to people who are expected to specify them.

Untimely Interference with the City Engineer

When you come to think of it, the city engineer is up against a hard thing in this country. In order to make a real success of his work he must be blessed with an extraordinary combination of good qualities. He must have the wisdom of Solomon, the diplomatic genius of Bismarck—and the patience of Job. These things are suggested by a remark that City Engineer Rust, of Toronto, was constrained to make last week: "What's the good of having an engineer if you do not depend on his judgment?" This protest was called forth by a suggestion from a controller that an independent engineer should be engaged to make tests as to whether piling or grillage should be used in the construction of the Don siphon. Upon this question rests the decision as to whether the contract for the work will be awarded to a Toronto or a Philadelphia concern. Apart altogether from the merits or demerits of the case, such a suggestion is a reflection upon the capability and integrity of the official, and is untimely at such a juncture. What, indeed, *is* the good of a city engineer without confidence in his judgment?"

Mr. T. Aird Murray, consulting engineer, Toronto, has received from Mayor Geary a letter conveying the thanks of the city autherities for the valuable suggestions offered in connection with the treatment of the city water. Mr. Murray's suggestion, which was adopted with great success, was to introduce chloride of lime into the waterworks tunnel.



1. Storage Yard for 36-inch, 54-inch and 72-inch Reinforced Concrete Pipe made on the Site of the Work

Progress on the Toronto Filtration Plant

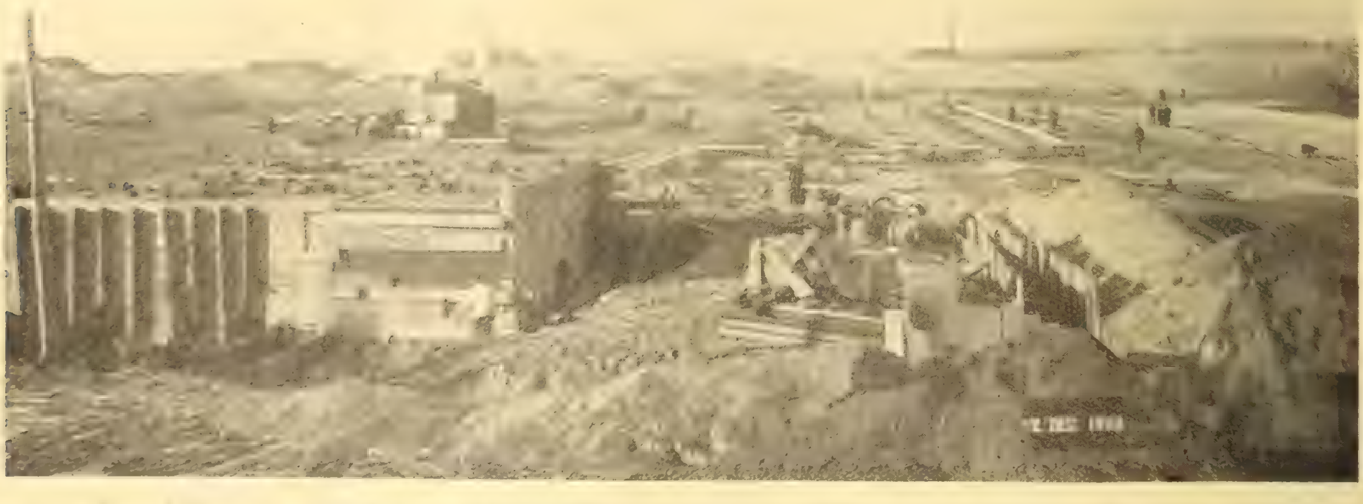
Third of a Series of Articles Describing the Details and Methods of this work Of Special Interest to Municipal Engineers and Contractors

CONTRACTORS: Messrs Dill, Russel and Chambers, Toronto

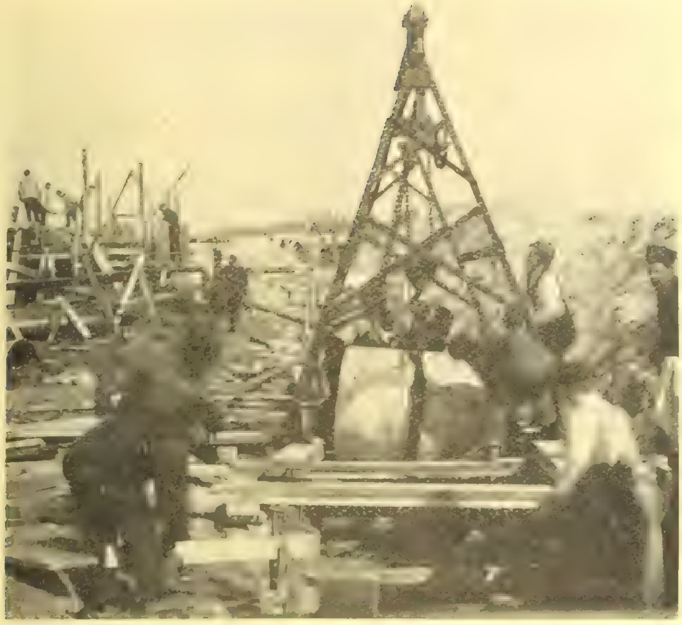
While the climatic conditions during the winter months naturally hampered the progress of the work and materially increased the cost, the progress made on the filtration plant since the publication of our last article (see "Contract Record," Dec. 1) was such as to call for commendation from the consulting engineer, Mr. Allen Hazen, of New York City, upon that gentleman's visit to the works early last month. Some idea of the strides that have been made in this work may be obtained by a careful comparison of the pictures shown here with those published in our issues of Sep. 29th and Dec. 1st last.

We show another view of the storage yard and site of manufacture of the reinforced concrete pipe used in this work. The illustration conveys an excellent idea of the large quantity of this material that it has been necessary for the contractors to have at hand. When the picture was taken, the storage yard contained about 1,100 feet of 72-inch reinforced concrete pipe, 540 feet of 54-inch pipe and 1,500 feet of 36-inch pipe, of which approximately 70 per cent. has been laid up to date. The expeditious manner in which the pipe has been turned out at Toronto Island is worthy of special note.

During the winter period the main attention of the contractors was concentrated upon those portions of the work, the early completion of which will enable the project to be pushed ahead with greater rapidity during the coming season. The most important problems in connection with this winter work were the difficulties encountered in transporting men and materials to the site of the work; more particularly before the ice on the bay was firm enough to support the men and teams crossing, and during the breaking-up period of early spring. The contractors maintained the water level in the drainage canal surrounding the work to the low point explained in article of Dec. 1st. The damp condition of the sand, however, affected the depth to which the frost took effect and, naturally, considerably increased the cost of all the excavation work done during this period. Excavation was made for the different sized reinforced concrete pipe lines, also for a multitude of smaller tile and cast iron pipe and for a portion of the filter beds. The foundations were put in for the second regulator house. These foun-



2. General View of part of the westerly half of Filter Beds and Central Court, showing Regulator House Foundation in foreground and Concrete Floor of Filter Beds in middle distance to right.



3.—"A" Frame Travelling Gantry used in lowering the 36-inch Concrete Pipe. (Designed by the Contractor, Mr. C. W. Dill.)

4.—36-inch Main Drain connecting with Pumping Station.

dations were carried down to a depth of approximately 7 feet 6 inches below lake level. At the site of the pumping station the foundations were put in to a depth of about 14 feet below the lake level, and the superstructure of the building has been erected. All of this work was carried out in heavy reinforced concrete. The construction of forms for the floors, piers and roofs of the filter basins and other preparatory work of a detail character was also accomplished.

As the weather permitted, concrete was also laid in the floor of the filter basins, the idea being, as in the former case, to afford every opportunity for the expeditious handling of the main filter works during the busy season. By an inspection of the accompanying views it will be seen that two of them are dated February 25th, 1910. At that time the scene of operations, despite the low temperature, was a hive of activity.

During these early months, the contractors have also been planning the lay-out of their extensive plant for the handling of the work for the season. A large screening plant, with capacity of over one full day's work, has been erected on the lake shore. A system of tramway lines has been installed for the prompt and effective handling of materials to the screens and storage bins, and from these out to the concrete mixers on the work.

The depth of excavation over the filter beds does not warrant the use of any method of machinery, economically, and this excavation is being handled by teams and wheel scrapers, the character of the material being well adapted for economical handling in this way, the only difficulty being the confined area within the drainage canal and the consequent lack of storage space.

In one of these pictures will be seen a section of 72-inch concrete pipe being lowered into place by means of a large derrick, and in the other, work is progressing on the 36-inch main drain between the filters, laid about 9 feet below lake level. From illustration No. 7 may be obtained an excellent idea of the method of outside jointing and bends. These bends were afterwards constructed of heavy reinforced concrete in special forms.

Special interest is attached to illustration No. 3, showing the "A" frame travelling gantry used in lowering the 36-inch concrete pipe. This gantry was designed by the contractor, Mr. C. W. Dill, when laying the 36-inch cast iron pipe line, about 3½ miles in length, from

5.—Lowering into place the 72-inch Reinforced Concrete Pipe by means of a large Derrick.

6. –Foundation of the Main Pumping Station. (The bottom of the Pump Well is about 15 feet below lake level.)

7.—72-inch Concrete Pipe Line, the Main from Regulator House to Pure Water Reservoir—Showing Method of Outside Jointing and Bends

the corner of College and Bathurst streets, Toronto, to the city reservoir.

The permanent office and laboratory building which is constructed entirely of reinforced concrete, is now nearing completion. Its appearance is all that could be desired and the structure reflects excellent workmanship, which has called forth expressions of the highest praise from engineers and contractors who have seen it. An illustration of this building, together with recent views of other interesting portions of the work, will be published in an early issue.

The force employed at the Toronto filtration plant during the winter season average about 100 men. This has now been augmented by about 60.

Cincinnati Filtration Plant—Cost of Construction

The following table showing the total and unit costs of the main features of the work done in the construction of the water purification plant at Cincinnati, Ohio, is prepared by Mr. J. W. Elms, the superintendent:

(Capacity of plant: 112,000,000 gallons in 24 hours.)

Work	Total cost.	Cost per million gallons of capacity for 24 hours.
Preparation of grounds	$ 33,359.67	$ 297.85
Pipe lines between settling reservoirs and head-house	55,354.77	494.24
Head and chemical house	144,989.85	1,267.77
Coagulation basins, gate houses and pipe lines	304,913.05	2,722.44
Filters, filter house, piping, sand and gravel	592,112.30	5,286.71
Piping, valves and gate-house between filters and clear-water reservoir ...	29,701.91	265.20
Clear-water reservoir	121,362.39	1,083.59
Total	$1,278,793.94	$11,417.80

Sewage Disposal Ideals*

By W. C. Easdale, M.R. San. Inst.

Ideals are useful in stimulating efforts towards the attainment of the nearest approach to perfection. As general principles, the ideal should be to consider efficiency first and cost second. All engineers should refrain from taking part in competitions of any kind. The ideal site for sewage-works is one which is sufficiently far removed from dwellings to prevent any possibility of nuisance arising, and it should be at such a level that the sewage can reach it by gravitation. Where this is not possible, only that portion of the sewage should be pumped which will not gravitate. The subsoil of the site should be suitable, if not for irrigation, at any rate for the final process after treatment in tanks and filters. In selecting the system of treatment, the chief factors to be considered are the character of the sewage to be treated, the extent to which it must be purified, and the fall available at the works. The ideal grit chamber is one that will arrest all the mineral matters in the sewage, but none of the organic matter, and it should have special facilities for the removal of the deposit. Screens, if used, must be designed in such a way that they will arrest the matters they are required to intercept, but allow all others to pass, and not readily become choked. There are so many types of tanks that it is extremely difficult to choose the most suitable type. The question is raised as to whether it is essential to have septic action as a preliminary process in all cases. The ideal method is such that it is adapted to the particular character of the sewage to be dealt with, and will produce the most suitable effluent for the filters, while at the same time reducing the quantity of sludge to the minimum, and preventing the possibility of nuisance from smell. In the construction of tanks attention must be given to the rate of flow through them, and special care must be devoted to the provision of every facility for the removal of sludge. In the design of contact beds the ideals to be attained are to make them absolutely watertight, to provide a self-cleansing gradient on the floors, and a false bottom over the whole area, and also to select the best material and see that it is properly graded. Another important point is to arrange them so that they can be operated in the proper manner. With regard to percolating filters, the ideals as to floors, false bottoms, and material laid down for contact beds, apply with equal force. The question of distribution is of prime importance, and the author considers that continuous distribution, where possible, is more efficient than intermittent. Humus settling tanks or fine-grain filters are necessary, in order to produce the ideal final effluent. From the general constructional point of view the ideal works should be executed in such a manner that while

8.—Toronto Filtration Plant.—The 36-inch Main Drain in the Central Court between the Rows of Filters, Laid about 9 Feet Below Lake Level they are constructed throughout in a substantial manner, and of materials which are the best of their kind, they should contain nothing which has not a direct bearing upon their efficiency in the production of a satisfactory effluent, and their maintenance in a good condition at the least possible outlay for repairs.

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*Extracted from paper read before the Society of Engineers (Br.) by Mr. W. C Easdale, M.R. San. Inst.

The Grand Trunk Pacific

One of the largest railway undertakings at present under way is the construction of the Grand Trunk Pacific Railway. Ground for this transcontinental road was broken at Fort William, Ont., on Sept. 11, 1905, and now, rather more than than 4½ years later, out of a total mileage of main line and branches of approximately 7,900 miles, there have been completed or are under construction approximately 4,800 miles, or 60 per cent. of the entire mileage authorized by the company's charters. Of the main line from Moncton to Prince Rupert, a distance of 3,550 miles, a total of 2,000 miles has been placed under construction, on which there has been laid 1,795 miles of track which in some cases is made up of disconnected sections, and is therefore not all continuous. That portion of the line, however, from Winnipeg to Edmonton, 793 miles, has been constructed and has been in partial operation by the construction department for the past 18 months, and within the past 90 days the track has been completed continuously from Edmonton westerly to Wolf Creek, 122 miles, thus completing the track laying on that portion of the line designated as the prairie section, Winnipeg to Wolf Creek, 915 miles. The track laying was also recently completed from Winnipeg to Fort William, thus making a continuous line from Fort William, via Winnipeg and Edmonton, to Wolf Creek, 1,360 miles, which, however, cannot be completed for practical operation for some months, as considerable work is required to be done on the easterly and westerly ends of the line, to put it in a suitable condition for the movement of regular trains. The other portions of the main line on which the rails have been laid are situated at different points east and west of the city of Quebec. During the past year contracts have been let for the construction work from Wolf Creek, Alta., westerly to Tete Jaune Cache in the Rocky Mountains, 179 miles, and there are at present engaged on this section of the line 1,000 teams and a large number of men. Similar forces are also engaged on the construction of the line from Prince Rupert, the terminus of the Pacific coast, easterly to Aldemere, B.C., 240 miles. In addition the provincial governments of Saskatchewan and Alberta passed acts at the sessions of their legislatures in 1909, authorizing guarantees for the construction of branch lines by the Grand Trunk Pacific Railway Company in these provinces to the extent of 686 miles, comprising branch lines from the main line of the Grand Trunk Pacific Railway to Yorkton, Regina, Battleford, Calgary, Lethbridge, McLeod and Coutts, the construction of which is at present under way. At the session of the Saskatchewan Legislature in December, 1909, an act was passed authorizing the guarantee of the construction of additional branch lines by the Grand Trunk Pacific Railway in that province, to the extent of 475 miles, comprising lines southeasterly to the United States boundary line, from the main line of the Grand Trunk Pacific Railway to Prince Albert, and from Regina westerly to Moose Jaw, Calgary, etc., and the construction of these will be undertaken during the present year.

9.—Toronto Filtration Plant The 72-inch Pure Water Pipe Line Showing Method of Lowering and Placing these Pipes, each of which weighed about 5 Tons

Concrete v Brick

Unquestionably concrete and cement and kindred material is gaining in favor, says "Brick." This condition is emphasized in some of the suburban districts of New York, where concrete or cement houses are becoming more and more common. Everyone knows that cement is not as good as brick. Even those who specify it admit that; but they also declare that the cost of brick construction is so heavy that they cannot afford it. Possibly there is some truth in this assertion; though cost should be considered as a relative term, and the man who wants a good house, one to last unblemished a lifetime or longer, will make no mistake in specifying brick. What cement and concrete will do after some years have elapsed it is impossible to say. They have not been used long enough to afford any opportunity of judging. It is, however, a condition that appeals very forcibly to the man of moderate means who wants to own his home, and undoubtedly the brick trade will suffer to some extent from this condition. The future may adjust the differences, but for the present brick men must seek some means of offsetting the influence which injures them and their business.

The disaster which occurred at the City Hall, London, Ont., some ten years ago, was nearly duplicated last week at the Austro-Hungarian Synagogue at Montreal. The Passover service was in progress and the building was crowded to the doors when the floor collapsed, dropping about two feet. The situation was saved by the rabbi, who managed to clear the church without having a panic. The synagogue, which is a handsome structure, was built about a year and a half ago. The collapse of the floor is attributed to overcrowding.

It is stated that a considerable amount of building is held up at Brandon, Man., owing to the high prices of building prevailing in that city. Commenting upon this, the Brandon "Sun" says: "It is the same old story. For several seasons people have been waiting for prices to come down in order to go ahead with proposed work, and each year the prices advance. They are sore now and they will be worse still if they wait another year. The fellows who get cold feet we shall always have with us, like the poor."

Bricklayers employed at the Dominion Steel plant, Sydney, N.S., are asking an increase in wages of [illegible] cents an hour. The pay at present is $3.50 for a day of ten hours and they ask for $4.20.

"Roxborough" Apartment House, Ottawa

An Attractive, Well-Appointed Structure Embodying the Latest Developments in this Class of Design Interesting Details of Various Contracts

Architect: Mr. H. C. Stone, Montreal, Que.

The Roxborough Apartment House, now nearing completion at Ottawa, presents many features of interest to the architect and contractor. The building is situated in an ideal position opposite Cartier Square, Ottawa, and is being erected by the Imperial Realty Company, Limited.

One of the main considerations in the design of this building was to afford every occupant the maximum amount of light and air; another was to avoid inside rooms. These results were obtained by the square four-winged plan. In the Roxborough apartment house the gloomy unsanitary centre court makes way for an arrangement that is infinitely preferable from both hygienic and æsthetic standpoints.

In its general treatment, the Roxborough apartment house, with its massive foundations, eight storey walls of pressed brick and cut stone, is a credit to the Federal capital. The skeleton of the building is of steel.

The terra cotta tile employed in the construction of the floors and partitions renders all rooms absolutely sound proof. This provision removes the cause, in so far as "The Roxborough" is concerned, for a very common source of objection to apartment house life. A special effort was made to give every apartment the privacy of an individual building.

Not only is provision made for the comfort of the tenants, but also for their health. Whatever may be the fashion elsewhere, the proprietors do not intend residents at "The Roxborough" to be fed with bacilli from the Ottawa water. An approved type of filtration plant has been installed in the building and every drop of water—even that supplied to the [illegible] is filtered.

The New "Roxborough" Apartment House, Ottawa, Ont.

Construction Work—The preliminary excavation work was commenced a year ago by Messrs. Holbrook & Sutherland, of Ottawa, who had the contract for excavating, stone, brick and terra cotta work. At various periods of the year this firm alone had as many as 50 and 60 men at work. The walls were completed before the close of 1909.

In planning the foundations, sufficient strength was provided to carry even double the number of storeys originally intended. A portion of the walls are built of silicate and the balance is carried out in red clay brick.

Plumbing and Heating—This contract was carried out by Mr. M. M. O'Connell, of Ottawa. The Webster Modulated Heating System is installed. It consists of two 70 h.p. high pressure boilers, carrying from 80 to 100 pounds of steam. The boilers are fed by automatic stokers. One of the principal claims made for the Webster system is simplicity. The heating is controlled, absolutely, by the occupant of the room. The pressure carried in the heating mains is less than one pound. Four hundred radiators were required to heat the various rooms. These were all of sufficient size to maintain a temperature of 70 degrees during the severest weather.

The plumbing work represents the last word in workmanship and materials. The plumbing fixtures bear the trade mark of the J. L. Mott Iron Works, New York.

The refrigerating system in the basement provides each apartment with a modern refrigerating plant. About seventy regrigerator boxes are installed.

Interior Woodwork—The interior woodwork and finish is by W. C. Edwards & Company, Limited. The floors are of first quality red oak. The doors are of red oak and are designed in one large panel the full size of door, these panels being five-ply to prevent warping. All the woodwork in the building is finished in solid oak with the natural wood finish. The hall panelling extends from the floor to the ceiling and is ornamented by large pilasters adorned with carved capitals.

Plastering — The plastering was executed in creditable style by Mr. Chas. Hunt, of Ottawa.

Painting, Glazing and Decorating—This contract was awarded to Mr. W. J. Carson, who had to supply some 500 plate glass windows, with glass from the well known English firm of Pilkington Bros., Limited.

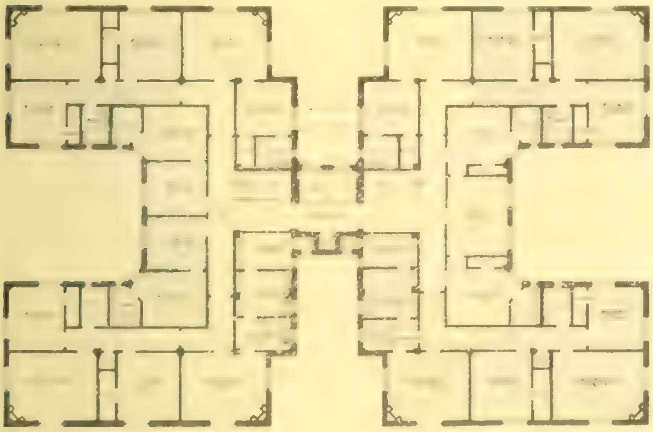
Other Features of the Work—The contract for tile for flooring, fireplaces and walls was awarded to A. K. Mills & Son. The bathroom walls are tiled with 6-inch by 2-inch white enamel tile, while the floors are laid with 3-inch hexagon white vitrified tile. There are 67 fireplaces in the building. The mantels are made of the best Canadian red oak. The hob grates installed are from W. H. Jackson of New York. Knoxville grey Tennessee marble is used for all the corridors and staircases, also for wainscotting and benches in the main vestibule.

The hardwood floors throughout the building were treated by the "Simplex" method, the contract for which was awarded to Floor Finishers, Limited, Ottawa.

The sandstone employed in the construction of the first two storeys of the Roxborough was supplied by the Laurentian Stone Company, of 85 Duke street, Ottawa (quarries at Hull and Gloucester). This stone was brought in the rough from Ohio, the large blocks being cut into the required size and prepared for the building by the Laurentian Company, who also prepared and placed the Stanstead granite base upon which the sandstone rests.

The crushed stone and cement used in the building were supplied by Wright & Company, Hull, Que. About 4,000 barrels of cement were required. The artificial stone used in the trimmings was supplied by the Canadian Art Stone Company, Limited, Toronto. The workmanship and durability of this stone is claimed to be equal to the best sandstone and is said to effect a great saving in cost. The sheet metal work and roofing was executed by the Modern Machine Company, Ottawa.

The building is equipped with a local telephone exchange and a private 'phone is installed in each apartment. A roof garden, now under preparation, will be an attractive feature during the summer months.



Typical Floor Plan, Roxborough Apartment House, Ottawa, Ont.

Mr. James Mather, architect, of Ottawa, was associated with Mr. H. C. Stone, of Montreal, in supervising the construction work.

W. G. McClelland [illegible] that, dated from May 1st, 1910, the [illegible] Sand & Dredging, Limited, Toronto, was changed to Sand & Supplies, Limited. The business carried on by this concern is of a more comprehensive nature than [illegible] indicated in the old title [illegible]. The offices and yard of Sand & Supplies, Limited, are located at Spadina avenue [illegible], Toronto. The company supplies sand for all purposes of construction and has every facility for [illegible] granite, limestone, cement, tile and other lines.

Contractors [illegible] March [illegible] hampered by shortage of labor. On one piece of work at the new [illegible] 20 laborers and 30 carpenters are wanted, while laborers and mechanics are wanted on other sections of the job. One company has received advices from [illegible] that a [illegible] of [illegible] on the [illegible] of a day [illegible]

Third Annual Convention Royal Architectural Institute

The third annual convention of the Royal Architectural Institute of Canada will be held at Winnipeg, August 24th to 27th, 1910. There is now under preparation a most interesting programme, containing items of interest to the whole profession throughout the Dominion, and every Canadian architect is cordially invited to all the sessions and entertainments of the Assembly. Reduced transportation rates have been secured from the railways and the occasion offers an excellent opportunity to visit the western metropolis.

The Business Side of Architecture

At a meeting of the Royal Institute of British Architects, held last month in London, a valuable paper was read by Mr. Alfred Hudson, barrister-at-law, from whose remarks we cull the following:

"One of the first matters with which an architect will have to deal when he confers with his employer is the question of cost, and to this all his ideas must be made subservient. For this purpose he must be trained to measure and estimate, and he must learn the value of different materials. It falls to the lot of very few architects to find clients of unlimited means, and it is still more rare to find even such clients willing to disregard questions of cost. Another example of equally necessary instruction is the proper specifying of the materials and the various works which are required to be carried out. This is a matter in which very great foresight is required, besides a thorough knowledge of every kind of detail. One of the first essentials in the student's instruction should be to teach him to describe accurately the various materials and methods of construction upon which he is receiving instruction during the course of his studies. It is not uncommon to find that a specification has been copied from an obsolete model describing materials which have ceased to be sold or manufactured.' "

Building permits issued at Fernie, B.C., during the first three months of the current year totalled $120,000, as compared with $560,000 for the corresponding period of 1909. During March, 1910, permits were issued to the value of $35,000, as against $200,000 for March, 1909. The high figures for 1909 are, of course, attributable to the great activity that followed the big fire in Fernie in 1908. The city is now practically rebuilt. Mr. G. H. Boulton, city clerk, looks for a total of about $250,000 for the balance of the year.

We have received from the publishers (44 Leicester Square, London, Eng.), a copy of the April number of the "Studio." The "Studio" is a most attractive magazine devoted to fine and applied art, and its perusal affords one a great deal of pleasure. In the current number are contained several articles of special interest to architects and those interested in kindred lines. The photographs which are used to illustrate "Recent Designs in Domestic Architecture" are particularly interesting, representing, as they do, [illegible] tiful of this kind of work to be found in the old country. In the continued article, "Architectural Gardening," illustrated [illegible] by C. E. Mallows, F.R.I.B.A., and F. L. Griggs, one may find many pleasing and tasteful [illegible].

Mr. Robt. Welsh, contractor and builder, of Picton, Ont., died [illegible]

The Place of Burnt Clay in Architecture

Strides made in Brick Manufacture—Fireproofing Tile and its part in the Evolution of the "Sky-Scraper"—Satisfactory Modern Methods

By F. W. Fitzpatrick

Recent excavations at Bisya, in Central Babylonia, unearthed portions of a brick temple that was built in 4500 B.C. The connecting mortar had crumbled away, but the bricks themselves are still perfect. Nearby are other brick relics of the time of Sargon, the first Semetic king of Babylonia, or about 3800 B.C., and an entire tower was unearthed whose bricks were still perfect and bore in legible characters the name "Dungi" that established the date of its construction as 2750 B.C. Go back to history as far as you can and you will find that soon after man ceased to inhabit caves and wooden hut-shelters he began to build of brick. In other words, the art of brickmaking is as old as is our civilization.

In places where easily quarried stone was available or in the neighborhood of great forests, naturally those materials were largely used in the earliest buildings, but even there brick did not lag far behind. And to brick and the vessels and urns and cylinders of burnt clay are we indebted for the accuracy of dates, and, indeed, much of the history of those earlier times. Everything of wood of those days has, of course, rotted, burned and been entirely destroyed; monuments and records of stone and of granite and of marble have crumbled and decayed and the inscriptions placed upon them are well nigh undecipherable, so with the writing or painting upon papyrus, leather and the woven textures, all of which have been dealt with harshly by the hand of old Father Time. Not so with burned clay! Time and the elements, even fire, have had no appreciable effect upon it. As a brick left the kiln six thousand years ago, so is it to-day, the one virtually imperishable, everlasting material known to man.

In our own country we at first brought over a few bricks from England, but soon began to work our local clay beds and, profiting by what we knew of English and German methods, it was not long before our bricks were in every way equal to those of foreign production.

Strides Made in Brick Manufacture

We may not have created any great novelty in the ceramic arts, but we have certainly made wondrous strides in the direction of mechanical perfection as far as manufacturing of brick and the other clay products is concerned.

In early times here, brick was the accepted material, the fashionable thing for our buildings. Stone was sparingly used for trimmings, steps and such details. Then, as we grew in wealth and it became the fashion to lavish expenditure upon our structures, domestic and otherwise, we had to have marble and granite and stone. The man who could afford but brick resorted to a stucco coating over it (painfully marked off to resemble stone pointing) to conceal his poverty. Later, brick began to be favored again in certain classes of buildings only, however, and pressed brick of perfectly matched color and shape had to be supplied. The result was monotonous in the extreme and such wall surfaces looked, for all the world as if they were kalsomined. In the past few years brick has come into its very own again. We are using straight kiln products, are not over anxious for evenness in color and shape and resort to brick not as a cheaper substitute for stone, an expedient, but because of its adaptability, its inherent beauty, its artistic effects, its lasting qualities and its resistance to fire.

And in that last named quality brick has no competition. To the layman a great granite structure is the symbol of the fullest expression of resistance to time and all attacks, the epitome of man's structural ability. Yet, let there be a fire within or near by that building and you'll see that granite spall and crack and literally explode—for each little crystal contains a minute drop of water, that, under heat, becomes steam and at a certain point can no longer be held in its shell, and, there being no safety valve, that diminutive boiler really explodes. There is no sadder looking wreck than a granite building that has passed through fire. Marble is of much the same texture and offers as little resistance to fire; sandstone likewise, and everyone knows what becomes of limestone that has been burned. Whether the fire be in a regularly constructed lime kiln or is fed with the fittings and contents of a store makes little difference, lime is the invariable result of burnt limestone. How silly it is to build a structure that is supposed to be fire-resisting of any of those materials. And iron and steel act equally badly in fire; they do not burn as does wood, but they twist and bend and warp out of all semblance of their original shape and any load they carry is let down, dropped. Of all building materials brick is pre-eminently the really fireproof one and the only one to be used wherever any structure or part of a building may in the least way be exposed to fire. It passes through such intense heat in its manufacture that no other fire, even of conflagration intensity, has the slightest effect upon it. The only danger is that the mortar in the joints may be destroyed, but if those joints be reasonably narrow and the cement a high quality, there is so little of that cement surface exposed the possibility of its disintegration all the way though is remote indeed.

In building fireproof buildings 30 and 40 years ago, they used brick arches between heavy iron floor beams. This made fire-resisting construction, but not absolutely fireproof, for the under side of the beams were exposed. Then, too, the weight was excessive and the construction therefore very costly. Yet, property was ever advancing in value and buildings thereon of only six or eight storeys produced inadequate returns. The tall building was a necessity, but there was no proper means of building it. The skyscraping steel skeleton frame was evolved, but, unprotected from fire, one might as well carry up ten, twenty storeys of wooden construction and expect safety.

Fireproofing Tile and the Evolution of the Sky-Scraper

It was stated that nearly all our work in this ceramic art was founded upon the antique. One detail, however, is essentially American, brand new, without precedent in antiquity or anywhere else and all our very own, and that is fireproofing tile, the hollow tile one sees piled in great heaps in front of the best and most modern fireproof buildings while the latter are under construction. And to that tile do we owe the modern, fireproofing tall building. For with it we are enabled to cover every particle of the steel work, to protect it from fire, and to build our floors of great weight-carrying capacity, of extreme lightness and of absolute resistance of fire. Until that tile was evolved, about 30 years ago, our tall buildings existed only in the vivid imaginations of some of our most progressive engineers and architects, it was the link that had been missing.

Those floor arch blocks are of a size to be easily and quickly handled. A solid block of similar size would be too heavy, would add tremendously to the weight and cost of buildings and, moreover, the insides would never be burned as densely as the outer layer of such a block, a fatal defect. Formed of thin webs and divisions as are these tiles, the kiln-fire burns them thoroughly inside and out, in every part, and to a uniform density. They are formed in arch stone shapes, with a key, as has every arch, set in cement, they give all the lateral resistance a floor needs, the depth to ensure stability and a carrying capacity that is surprising. The inner air spaces form great sound deadeners and also contribute to the fire-resisting qualities of that tile. To-day all sorts and shapes are made, forms to protect every kind of steel column, other forms to protect beams and girders and trusses, tiles for partitions, tiles for furring, for roofs. All these are properly scored and roughened so that they will hold the plastering that is applied on those partitions and ceilings, and there are provisions made for the steel tie rods that are necessary, for the running of plumbing pipes, wires and the endless minutiæ that goes into a building, the details that the layman wots not of, that are all hidden in the very vitals of the building, and yet are so essential.

The invention of this hollow tile was the greatest single step that has ever been taken in the evolution of our modern tall building, it, as we have noticed, made that building possible. Chicago was the first to use such tile, then New York, and now the entire country. Millions of tons have been made and used in the 30 years since its invention. It has been introduced into other countries, though they do not build as high as we do, and here, too, it is now being used in small and low buildings, whenever the best is desired. The tall building is the most salient feature of our architecture, it has compelled us to adopt a certain character of design, has forced us to get away from certain hackneyed precedents of European schools and given us an individuality of style and construction that places us apart from and above—in more than one sense—all other nations. The tall building was made possible, feasible, a reality and not a dream, by the invention of fireproofing tile.

Reinforced Concrete as a Competitor

Of late years reinforced concrete has come to the fore and chiefly as a competitor of that hollow tile for fireproofing purposes. Various vicissitudes have attended its development. Of all systems of construction, it requires the greatest care, it is monolithic, so that as a whole it can only be as strong as its weakest detail; it is almost invariably used where tile is deemed too expensive, therefore the temptation to do it cheaply is always present; it is so dependent upon mixing and the amount of water used and the quality of cement, and all such minute details, that only an expert chemist should make it, so as to secure anything like uniformity, standard accomplishments, instead of which the cheapest of unskilled labor is generally deemed all that is necessary. Therefore, it is not surprising if many and fatal collapses have occurred and that where the very best is desired tile, that long since has passed through its experimental stages, is still invariably used for fireproofing. Recognizing the structural possibilities of well done reinforced concrete instead of steel, many of the highest authorities commend the system that use concrete for the structural members, columns, girders, etc., of a building, but that encase and protect these in turn from fire with hollow tile. The floors are built of tile blocks set apart and concrete poured in the spaces, forming concrete supporting beams that carry the load but are not exposed at any point to the attack of fire.

The making of hollow fireproofing tile has been reduced to an exact science. Every contingency is foreseen, and provided for, the tile is standardized, it is tested, it is handled by only skilled workmen and every day new uses are being found for it and it is further perfected to meet these new requirements. The houses are all tile houses, the outer walls, the floors, the roof, the partitions, absolutely eliminating wood and even steel, save in reinforcing rods, etc., in all the structural parts. Men everywhere who really appreciate the advantages of living in a house that cannot be destroyed by fire are turning their attention to this form of domestic construction. In New Jersey there is an entire settlement springing up of wholly tile houses; in Chicago and all about us there are houses being erected, ideal houses, safe, low priced, beautiful and virtually everlasting.

Satisfactory Methods of Modern Practice

In constructing large buildings, especially commercial ones, men have grown wise enough to use fireproofing methods in the structural parts, and as little combustible materials in others as is compatible with proper economy. Where they have not sense enough to do so voluntarily, building laws generally compel them. It is in the construction of houses, where people do more or less what they please, that wood is still used more than far-sighted judgment would justify. There was a time when such construction was made inevitable by economy, but in the last 20 years timber has gone up over 100 per cent., while the prices of brick and tile and cement, by reason of improved methods of manufacture, have been cheapened so much that, all things considered—durability, repairs, warmth in winter and coolness in summer, insurance, freedom from vermin—a fireproof house means a better investment ultimately than a wooden one. There are cases where even the first cost of a fireproof house is less than it would have been had it been built of wood. As a general proposition the country, over the additional cost of first class brick and tile construction, is anywhere from five to ten per cent. more than for wood. In the ordinary dwelling there are floor joists, cross-bridging, a rough floor, paper, or other deadening material, and a finished floor—all combustible, the whole costing something like 25 cents a square foot, including the plaster on the ceiling below. In fireproof construction, using hollow tile in monolithic wide spans, covered with an asbestolithic or other incombustible plastic flooring, and the under side plastered, there is an expenditure of from 26 to 28 cents. Is not the use of wood in private dwellings a habit which ought rapidly to disappear?

It is disapeparing, and very largely because of the devastation of our forests, wood is fast becoming prohibitively expensive. Not an undisguised blessing, for so long as wood was cheap we used it, and our cities burned up; without it and with a modicum of good sense, we will turn and have turned our attention to non-inflammable substitutes for the frame buildings of our fathers. And this perfecting of hollow fireproofing tile may also be taken as an example of an application of the truism that human ingenuity may be always depended upon to step forward at the right time and place and give use that which is needed most.—"Brick."

Enduring Qualities of Brick

In uncovering the fine stone bridge over the moat at Hampton Court Palace, some interesting discoveries have been made. In the wall of the north wing two large archways have been revealed, evidently designed to bring the water into the moat; and on the south side have been found some curious brick steps leading by an archway into the moat from a subterranean way underneath the rooms now occupied by Lord and Lady Wolseley. There is much, says Mr. Ernest Law, in the "Times" of March 25th, which points to the waters of the moat being utilised to flush the vast system of arterial drainage which was one of the main features of Wolsey's palace. The brickwork of both the moat wall and the main building, though buried for 200 years, has mostly been found in as satisfactory a state as the stonework of the bridge. Where it was otherwise, it has been carefully patched with the old Tudor bricks. Tens of thousands of these—unrivalled for their texture and their varied tones of rich color, extending from dark purple and crimson [illegible] have been [illegible] from the debris and put ready for the [illegible].

Maintenance Cost in Ditching

The cost of maintaining ditches often receives less attention from the engineer in charge of their construction than it should. The amount of repair work may be very considerably reduced by careful designing.

A uniform rate of fall is, of course, the ideal to be aimed at in establishing the grade line, but this cannot often be secured. Humps are less objectionable in the grade than sags, because if water containing suspended matter passes [illegible] to a flatter slope the deposit of sediment at the sag will give trouble.

Open ditches should be at least 8 feet wide at the bottom. For narrower construction tile should be used. The narrower the ditch, the greater the chance of the flow being interfered with by sediment. The cross-section should be as near as possible to the shape of the letter U, but with legs slightly inclined. Step slopes are to be preferred to flat ones.

Concrete bridges should not be used across ditches that may require cleaning with a floating dredge. Steel bridges that can be lifted and replaced will be more economical in the long run.

Branches of the main ditch should form an acute angle with it, and care should be given to the construction of outlets to avoid deposits. Annual maintenance work should be done to avoid more expensive reconstruction. For this, hand work is best, because least destructive. Where scrapers are used it is a good plan to lift them out with derricks to avoid injury to the slopes by teams.

Sewage Disposal Works, Birmingham, Eng.

An interesting paper relating to the above undertaking was recently by Mr. John D. Watson before the Institution of Civil Engineers. In the course of his address Mr. Watson said that the works described in his paper had reference to a drainage area in Birmingham and the surrounding district of nearly 100 square miles, with a population of about 950,000. The system of sewage treatment formerly adopted was a combination of lime precipitation and land irrigation, but in conducting experiments in 1900 on biological methods of treatment it was found that Birmingham sewage was capable of purification by the septic tank process, and the excellent results obtained from further experimental work decided the Board to advance on biological lines. There had now been constructed a biological plant, including upwards of 50 acres of bacteria beds, storm-water tanks, etc., at an actual cost, exclusive of land, of £400,000. This had been done, not because the principle of purification by land irrigation was regarded as bad in itself, but because the Board felt it to be their duty, as representing the public, to see that their works were made as good as possible in the light of modern discoveries, even though it should be necessary to superimpose a new work upon one which had so recently been characterized as the best available. The average dry-weather flow as measured in 1908 was 27,000,000 gallons, and the estimated average volume of liquid trades waste discharged into the sewers per day was 4,000,000 gallons. The influence of this trade waste upon the average flow was shown markedly by the comparative paucity of micro-organisms; for while London sewage contained an average of five to six million organisms per cubic centimetre, the Birmingham sewage had an average of only 500,000. Analysis brought out the fact that the more metal works were connected with a particular sewer the fewer the organisms in the sewage. He had a distinct preference for the percolating type of bacteria bed, the only serious drawback to the adoption of that system in a very large installation being the difficulty of distribution. He was of opinion, however, that this could be overcome by spraying the sewage under pressure. The pumping station was equipped with motor-driven centrifugal pumps, and sufficient pressure was obtained to give about 20 feet. A storm-water basin had been constructed to impound 13,000,000 gallons of sewage. In spite of the cost of substitution of one method of treatment by another, the rate per tenement had not materially increased, being 4.32d. in the pound for the last financial year, compared with 4.21d. in 1901-2.

Cost of a Concrete Roadbed

The following interesting and suggestive comparison of costs for concrete and ballasted roadbeds is presented by "The Engineering Record":

The concrete of the Delaware, Lackawanna & Western Railroad in its new Bergen Hill tunnel was designed by Mr. Lincoln Bush, and was described in the "Engineering Record" of Oct. 17th, 1908, and April 3rd, 1909. A detailed account of its cost and the estimated cost of a ballasted roadbed for the same tunnel, as well as comparative annual expenses, were recently published in the "Railroad Age Gazette." The estimated cost of a ballasted track for a length of 4,280 feet, including two lines of 12-hole conduit, tile drains and creosoted ties, was $14.62 per linear foot of double track, while with the conduits omitted the estimated cost was $10.15. With this type of roadbed adopted, the amount of tunnel excavation and the cleaning up of muck cost the same as for ballasted track, but the tile drains and ditches for them were eliminated. The railroad company furnished concrete materials, and their cost, plus $3.50 paid to the contractor, made the total cost $6.25 per cubic yard. The actual cost of the roadbed as built, including the conduits, was $14.26 per linear foot of double track, while with the cost of the conduit construction subtracted, the figure is $13.18. The maintenance of the roadbed requires one inspector at night and one during the day, at a total cost of $90 per month, while the ballaster roadbed of the old Bergen Hill tunnel, which is the same length as the new tunnel, requires a gang of laborers, a foreman, and a watchman with a payroll of $565 per month. Capitalizing the investments for ballasted track and for the concrete roadbed at 4 per cent. and adding the difference in the cost of maintaining, the saving due to the concrete roadbed, as built with conduits, per year per mile of double track, amounts to $7,107.32. With the conduits omitted, the saving would be $6,389.42.

"Standard" Sanitary Goods

Reference was made in a recent issue of the "Contract Record" to the decision of the Court of Appeal in the case of the Standard Sanitary Manufacturing Company, of Pittsburg, Pa., versus the Standard Ideal Company, of Port Hope, Ont., the court confirming the decision of the Superior Court restraining the defendant from using the word "Standard" in connection with enamelled bathtubs, lavatories, sinks, and other enamelled ware. It is therefore of interest to note the announcement of the incorporation of the Canadian Sanitary Manufacturing Company, Limited, with a capital of $1,000,000 to acquire the business and assets of the Standard Ideal Company, Limited, of Port Hope, Ont., and carry on the manufacture of enamelled ware, plumbers' supplies, etc. The charter of the new company is a broad one.

Building permits issued last month at Fort William represented a total of $250,000. For April, 1909, the figures were $1,119,000. This sum, however, included the permit for the $942,000 elevator plant constructed on the G.T.P. terminal property. There is notable activity in residence building at Fort William this season, according to the report issued by Building Inspector McNamara.

Small Concrete Blocks in Roadway Work

Methods of Manufacture and Results Obtained in Service—Details of Cost for Guidance in Estimating on Similar Construction

The New York State Highway Commission authorized the expenditure, some time ago, of $2,250 for the purpose of experimenting with small concrete blocks as a roadway pavement. The blocks consisted of 2-inch cubes made of different materials and laid on Ridge Road, northwest of Rochester. The method of manufacture and the results obtained in service were the subject of a paper by Mr. George C. Wright, consulting engineer, before the recent convention of the National Association of Cement Users. The data, Mr. Wright explained, were largely taken from a report of Mr. J. Y. McClintock, county engineer of Monroe County, to the Highway Commission. The following data are taken from Mr. Wright's paper.

The advantages expected from this type of pavement are as follows: Comparative freedom from dust, smoothness of surface, good footing for horses and wheels, pliability permitting of changes in the base due to freezing and thawing, and movement due to the contraction and expansion. As these cubes could be supported on any suitable local stone or gravel, the cost per mile for first class road would, Mr. Wright thinks, be very much below that of ordinary paving brick and more lasting than any of the asphaltic or bitulithic mixtures, and further, the maintenance would be simplified and reduced in cost.

On Ridge Road, the original trap-rock surface, 2-inch thick, was worn completely off at the centre and nearly so at the sides of the 16-foot macadam roadway, leaving exposed the good solid lower course of rather large size broken Medina sandstone, resting on a good gravelly foundation.

General Methods Employed

The existing surface was somewhat rough and knobby, and over this was spread as thin a layer as possible of screened gravel, which was rolled down with a 12-ton roller, so that in spots it was 2 inches thick and in other places, over the knobs, it was no measurable thickness. The resulting surface had a crown of about 4 inches in 16 feet width.

On this bed so prepared was placed directly a wearing coat of 2-inch cubes for a width of 15 feet, being laid close together by hand, the edges being held up temporarily by 2-inch planks laid lengthwise with the road. On the cubes was spread a small amount of fine, somewhat loamy, gravel, which was broomed in, after which the heavy roller was slowly passed over the whole of the surface, forcing the cubes to take a full bearing on the supporting gravel. The edges and roller wheel were supported by the planks, then the side-planks were pulled up and moved ahead and coarse gravel, ¾ to 1½-inch, was placed along the sides next to the cubes on the shoulder for a width of about 2 feet. Outside of this a finer gravel was spread, feathered off to a width of about 3 feet, more of the fine loamy gravel was spread on the top and broomed and flushed in until the space between the cubes was thoroughly filled, the gravel on the shoulders was wet and the whole surface thoroughly rolled with the heavy roller.

A stretch of road 1,800 feet long was surfaced with cubes. On 1,600 feet Portland cement gravel concrete cubes were used; on 200 feet vitrified shale cubes 2½-inch in size were used. For a length of 100 feet a 6 x 9-inch concrete [illegible] curb was used in place of the gravel shoulders. On 100 feet the joints between the cubes were filled with Portland cement grout instead of the fine loamy gravel. For 60 feet, on which the joints were filled with the fine gravel, light asphaltic road oil was sprinkled over.

A machine for making cubes which is an adaptation of the ordinary cement brick machine, was furnished. This machine made 68 cubes at one operation, resting on a wooden tray, and the tray was carefully placed on a drying rack without disturbing the freshly made cubes. The cubes remained in the racks 24 hours and were then dumped in a pile. This pile was thoroughly sprinkled twice each day. The number of cubes made the first day was about 7,000, but within a few days the same gang was able to make 26,000 with ease.

Cost Data and Other Information

Various sizes of screens, from ½ to 2-inch, were tried, but it was found that the ½-inch screen gave a product that could best be handled in the machine. Experience showed that the concrete had to be rather dry in order to avoid settling and bulging of the cubes before the concrete set. Seven men and a foreman did all the work. The amount of cement used averaged 2.2 barrels to a cubic yard of concrete.

The area covered with cement cubes was 2,652 square yards, upon which was laid all of the 730,000 cubes manufactured, except about 5,000 kept for repairs.

The cost per square yard of the cubes laid was as follows: cement, 0.088 barrels, $0.121; cost of factory, $0.107; labor of manufacture, $0.161; gravel at 50 cents per cubic yard, $0.024; carting, $0.027; laying, $0.072; total cost per square yard laid, $0.512. There were placed on shoulders 219 cubic yards of gravel, covering 1,800 square yards, costing $2.12 per cubic yard rolled in place, or 26 cents per square yard.

In considering these figures as the basis for estimating cost, Mr. Wright pointed out, there might be reductions made in cost of cement by using a reduced quantity, and in the cost of carting; the cost of the factory might be distributed over many more square yards; the cost of labor might be reduced by the use of a concrete mixer and other labor saving devices; the cost of gravel in pit is usually nearer 10 cents per cubic yard than 50 cents. The cost of laying was very much reduced as the men became experienced, and this could be still further reduced by paying for it on the basis of piece work.

Mr. Arthur Priddle, of San Francisco, inventor of the Inner bond steel bar for concrete reinforcing, was recently in Toronto making arrangements for the manufacture of this bar in Canada.

A section of the Vancouver city council has been raising an outcry against "sky-scrapers." At a special meeting of that body last week it was decided not to alter the 160-foot limit in the present by-law.

The Minister of Railways has given notice of the annual railway subsidy resolutions. This year they are all revotes. In all, 44 votes are proposed, and on the basis of $3,200 to the mile the total will amount to $8,862,400.

Vancouver's building total for the first three weeks of April totalled over a million dollars. During the whole of April 1909, the permits reached $783,190. During the current year, so far, the permits issued aggregate four and a half million.

The Building Trades Council of Vancouver has issued to the master builders of that city a solemn warning that on and after May 2nd it is intended "to enforce a more strict recognition of trade union conditions on all buildings in Vancouver and vicinity, either in course of erection, repair or alteration."

Satisfactory Arrangement of Piping System for Steam Heating

When a building is equipped with a hot water service the source of supply is from a hot water generator, in the form of a tank with a coil of pipe, through which is circulated either high or low pressure steam.

If the boiler plant is operated at high pressure, and the water of condensation returned to the boiler through a pump and receiver, the hot water generator is connected up as shown. That is, the high pressure steam connection from the boiler is carried to a point near the tank where a reducing valve is inserted, the object of which is to have any desired pressure below the maximum, consequently any desired temperature of steam to do the heating. The pressure reducing valve is by-passed, so if at any time it is necessary to make repairs it may be done without interrupting the hot water service. There is also a low pressure connection from the heating system, which is made the full size of the tank coil, the service may be continued when the boilers are operating at low pressure for heating purposes only.

The steam passing into the coil is very rapidly condensed, and the water of condensation flowing to the trap from whence it is discharged to the receiver of the pump and by the pump returned to the boiler.

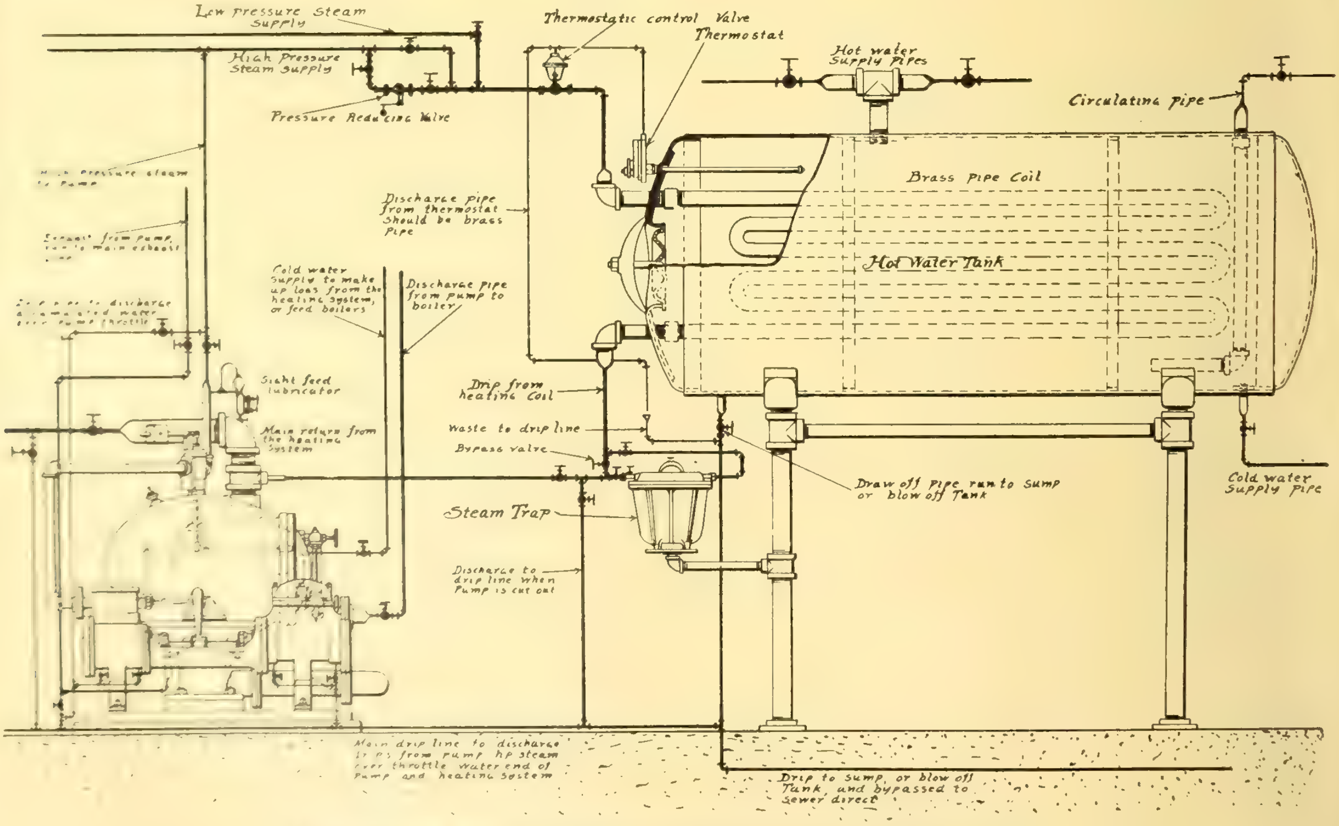
The trap is by-passed so the water from the coil may flow directly to the pump receiver when the pressure in the coil is equalized by the reducing valve with the pressure on the heating system, or it may be allowed to run direct to the sump, or blow-off tank, when for any reason it is so desired.

The temperature of the water in the tank is controlled by the thermostat, the connections to the throttle valve and waste being made as shown.

The various steam exhaust, drip and cold water connections to the pump and receiver are shown with their necessary controlling valves as usually made by the steamfitter.

Effects of Wind on Ventilation

The effect of wind on ventilation and heating was the subject of a paper read by H. W. Whitten before the American Society of Heating and Ventilating Engineers. The most apparent effect, Mr. Whitten states, is the inleakage of air through crevices, while the least apparent but nevertheless important effect is the outflow of warmed air through crevices in the sheltered side of the building, caused by an area of low pressure in the lee of the building, which acts as a partial vacuum. As the pressure of the inside warm air is naturally outward, the combination of this pressure with the partial vacuum outside produces a greater loss than is sustained on account of inleakage, assuming the aggregate amount of crevices on each side to be equal. The author then describes a few typical tests made by him and others in this connection, some of which are given here. A room situated on the east side of a rectangular school building, with a northwest wind blowing 14.5 to 15 miles per hour and an outside temperature of 33 degrees, showed an average rate of supply velocity of 817 feet per minute and a vent velocity of 340 feet per minute, giving a loss of 477 feet per minute. The inlet was 8 feet above the floor and the outlet at the floor, both being of equal size and on side of the room opposite the windows. An air test showed 10 parts of carbon dioxide in 10,000. A test of another school building with wind at 18 miles per hour and outside temperature of 30 degrees, the building being heated and ventilated by the gravity indirect system, showed an average loss of 20 per cent. from the supply ducts and an addition of 60 per cent. to the vent velocity in rooms on the windward side. Rooms on the leeward


Low pressure Steam Supply
High Pressure Steam Supply
Pressure Reducing Valve
High pressure steam to Pump
Exhaust from pump run to main exhaust line
Discharge pipe from thermostat should be brass pipe
Cold water supply to make up loss from the heating system, or feed boilers
Discharge pipe from pump to boiler
Sight feed lubricator
Main return from the heating system
Drip from heating Coil
Waste to drip line
Bypass valve
Steam Trap
Discharge to drip line when Pump is cut out
Main drip line to discharge drips from pump hp steam over throttle water end of Pump and heating system
Thermostatic control Valve
Thermostat
Hot water Supply Pipes
Circulating pipe
Brass Pipe Coil
Hot Water Tank
Draw off Pipe run to Sump or blow off Tank
Cold water Supply pipe
Drip to Sump, or blow off Tank, and bypassed to Sewer direct

Arrangement of Piping System for Steam Heating—Reference Diagram side of the building showed an addition of 30 per cent. to the supply velocity and a reduction of 62 per cent. of the vent velocity. Another test was performed in a high school building. After shutting down the fan the supply ducts were closed in the rooms on the exposed side of the building and, with all doors and windows close, it was found that as much air was being removed from the vent ducts as the fan system was supposed to supply. During this test the outside wind was of moderate velocity.

Rule-of-Thumb Methods in Brick Making

And the Consequences Thereof—Competition of To-Day Demands Detailed Records and Constant Study of Principles Underlying Operation of Plant

We have on several occasions compared the manufacture of bricks and other clay products to domestic cookery, in that a similar amount of skill is required in the various processes of preparing the raw materials into a suitable paste, and in the baking or heating necessary to convert them into a marketable product. The comparison may be pushed still further by comparing the ordinary housewife with a professional baker. The former uses cups and spoons as measures, and the quantities obtained in this way often vary as much as 20 per cent. from the correct amount, whilst the baker works with accurate weights and measures, and consequently his results are more certain than are those of the ordinary cook, for the simple reason that he proceeds on a more systematic plan.

In clayworking it often happens that after a firm has got into a serious difficulty with its manufactures, it does what it should have done years before, and obtains the right kind of information as to the best method of working, instead of relying on traditional methods which may be all right for a time, but which must, sooner or later, fail.

In former times, when the prices of bricks and tiles were far better than at present, the traditional methods of working were sufficient, because from a given clay-hole the material most suitable for the purpose might be taken out and the rest left behind, but with the keener competition of modern times, such careful selection is made far more difficult, and some attempt must usually be made to use all the material direct; for the success of many yards depends on the utilization of what 20 years ago would have been considered as "waste" or unsuitable.

The traditional methods of working are all right so long as materials continue to be constant in composition, but a comparatively small change in either the clay or the fuel will often work havoc, unless it is accidentally detected at once. The detection can only be accidental, for by the very nature of the case a works run on rule-of-thumb methods has no means of checking an unexpected alteration of this sort.

A remarkable instance recently came to light in this way. A firm of fire brick manufacturers who had sold their goods chiefly for export, tendered for an important municipal contract, but found that their bricks came so badly out of the tests that some doubt was expressed by the municipal officer as to whether a non-refractory brick (i.e., a buff building brick) had not been accidentally submitted. Analysis of the brick and of the various clay deposits showed that a seam which was considered to be excellent fireclay had run out, and a new seam in the same position in the mine was entirely different in composition, though very similar in texture. Similar changes in composition are constantly found in deep mine clays, though the change in texture often gives the miners some clue.

Modern methods of clayworking must be kept so fully up-to-date, if the present competition and low prices are to continue, that three methods of work must be continually in use: (1) Frequent investigation of the raw materials (including the coal); (2) Constant study of the principles underlying the working, with attempts to bring the actual practice more closely in agreement with the theoretically best methods; and (3) the maintenance of sufficiently detailed records, so that the results of all previous successes and failures may be readily accessible when needed.

Many clayworkers at the present time have made various "improvements" and changes from time to time, and in several instances it is very difficult to ascertain how far difficulties have resulted from the material and how far they are due to changes in the method of treatment. The problem can, of course, be solved by making numerous and often costly tests, but these might have been avoided had the firm insisted on full records being kept of any change, no matter how slight, in either the materials used or the treatment to which they were subjected.

This matter of records is far more important than is commonly realized, and one firm of brickmakers owes its present prosperity and the successful weathering of a great crisis simply to the fact that, when things became critical, the records available enabled the difficulty to be overcome in a few weeks, whereas several months would have been needed in their absence. The clay had "run out," the Government Survey records were not sufficiently detailed at this place to show with the necessary accuracy the run of the clay, and much costly boring would have been neessary but for the fact that the rough survey of the ground which could be made from the carefully made notes of the manager of the clay-hole enabled an up-cast to be detected, and the corresponding down-cast to be located. No rule-of-thumb working can avail in cases of this kind.

The Quebec Harbor Commissioners have given their carpenters and laborers an increase which amounts to about 25 cents a day.

At Brantford, Ont., during the first three months of 1910 permits were issued to the value of $26,670. During the first quarter of 1909 the total was $15,505. For March, 1910, and March, 1909, the totals were $11,470 and $10,315 respectively.

At a meeting of architectural draughtsmen held recently in Winnipeg for the purpose of discussing certain clauses of the bill recently passed by the Manitoba Legislature in regard to the examination and registration of architects, there was formed the Manitoba Association of Architectural Draughtsmen. Subsequently a committee was appointed to take up with the Manitoba Association of Architects a number of points which the draughtsmen consider inimical to their interests.

Canadian City Engineers

Mr. Jas. A. Bell, St, Thomas, Ont.

The subject of this sketch was born in the township of Lobo, Middlesex county, Ont., in 1851. He was articled in 1872 to Mr. W. G. McGeorge, C.E., O.L.S., and passed the final examination for the degree of O.L.S. in 1875. In 1887 he was elected a member of the Canadian Society of Civil Engineers. Mr. Bell has served St. Thomas as city engineer for two periods aggregating a quarter of a century. As previously stated in these columns, he will retire at the end of the present year in order to give more time to his extensive private practice, which he has been building up since 1876. The two periods during which Mr. Bell has held office as city engineer of St. Thomas are from 1881 to 1891 and from 1896 to the present time. Mr. Bell has been county engineer of Elgin since 1882. In this capacity he has had charge of all public works carried on in the county of Elgin. In 1882 Mr. Bell surveyed and located the present line of the Michigan Central Railway, from Essex to Windsor, and from Welland to Niagara Falls. The following year he had charge of construction on the Cantilever Bridge, under Mr. A. R. Trew, C.E. Some idea of the extent to which Mr. Bell has been consulted by municipalities throughout Ontario may be gathered from the fact that he designed and built the waterworks systems at St. Thomas, Paris, Milton, Aylmer and Tilbury, also the original sewer system and sewage disposal plant at St. Thomas. In private practice Mr. Bell is a member of the firm of Bell & McCubbin, civil engineers, whose specialty is municipal work.

Mr. James A. Bell,
City Engineer of St. Thomas, Ont.

The Winnipeg Stone Company is suing Messrs. Seneschal & Smith for $10,000 which they claim to be the balance due on work executed by them in connection with the building of St. Boniface Cathedral, for which the defendants were the contractors.

Personal News and Notes

The resignation is announced of Mr. R. W. Farley, M.Can.Soc.C.E., city engineer of Hull, Que.

A builders' exchange has been organized at Moose Jaw, Sask. The new institution will be affiliated with the Winnipeg exchange.

Mr. James Bacon, harbor commissioner for the G.T.P. at Prince Rupert, has resigned with a view to engaging in private practice.

Mr. T. A. Kennedy, contractor, Fort William, Ont., has just returned to that city after an extended trip to western Canada and the coast.

It is interesting to note that Property Commissioner R. C. Harris, of Toronto, has also been placed in charge of the street cleaning department of that city.

Mr. David Adams has been apointed assistant city engineer of Vancouver, B.C. Mr. Adams was seven years under the city engineer of Glasgow, Scotland.

Mr. Alexander C. Potter, C.E., the New York expert who has been engaged to supervise the design of a sewerage and waterworks system for Edmonton, Alta., arrived in that city last week.

Mr. C. R. Coutlee, of the Ottawa branch of the Canadian Society of Civil Engineers, will deliver an address before that body on May 4th dealing with the water power possibilities of the Ottawa river.

It is with much regret that we have to report the death of Mr. C. L. McIntosh, treasurer of the J. I. Case Threshing Machine Company, Racine, Wis., which occurred in Naples, Italy, on April 19th.

Mr. Arthur A. Ridler, who was formerly connected with the Roadway Department at Toronto under City Engineer Rust, has secured a position on the engineering staff of the Constructing & Paving Company, Toronto.

Mr. P. L. Fraser, secretary of the Builders' Exchange, is captaining one of the teams that are out to raise $600,000 for new Y.M.C.A. buildings at Toronto. It is gratifying to note that half the amount was subscribed in the first 24 hours.

City Engineer Rust, of Toronto, accompanied by Mayor Geary and Alderman McCarthy of that city, left on the 28th ult. for Boston in quest of information relating to subways and with a view, possibly, to engaging an expert engineer in this connection.

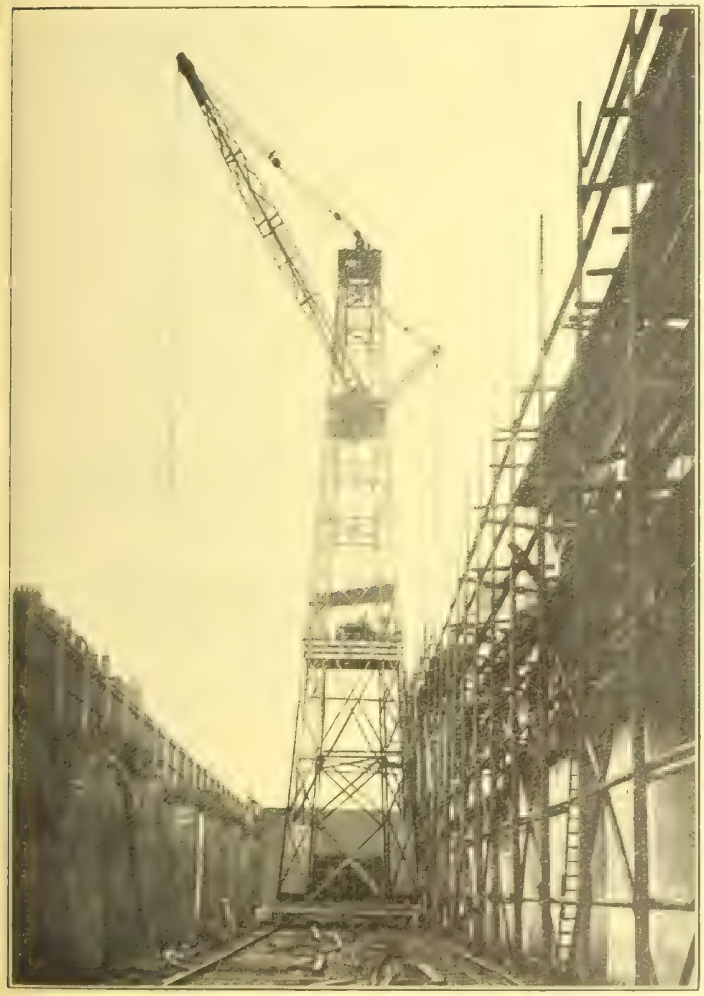
Mr. J. W. Hynes, the Toronto architect, left the city last week for Rochester to attend the Second National Conference on Civic Planning. Accompanying Mr. Hynes were Dr. C. R. Dickson and Mr. J. E. Fetherstonhaugh. All were delegates from the Guild of Civic Art

The London Concrete Machinery Company, Limited, 19 Marmora street, London, Ont., are now making arrangements for the erection of a new plant about eight times the size of their present establishment. This firm has built every season since its organization, but within the last year they have added several heavy lines of concrete machinery, such as mixers, crushers, etc., and their business has increased four-fold during the past year. Within the last few months it has been necessary for them to have a large part of their work done in other shops by contract, and on this account the directors have decided to secure about two acres of land and proceed immediately to build a new plant. Their present building, although new and commodious, will, no doubt, be used for other manufacturing purposes.

Contractors' Electrical Tower Crane

A tower crane of unusual design, which has attracted much interest amongst builders and contractors of the old land, has lately been put into commission on the building operations in connection with the extension to the British Museum at Bloomsbury, London, Eng. It was specially designed and built by Geo. Anderson & Company, Limited, of Carnoustie, Scotland, whose Canadian office (located at 157 Craig street west, Montreal) has supplied us with interesting particulars.

As will be seen from the accompanying cut, the tower is composed of three sections, the divisions being made at the platform which carries the motors and operating machinery, and at the platform carrying the sole plates for the two jibs. As a whole, the tower may be regarded as being made up of four corner posts, each having a rectangular section of 4 feet by 3 feet at its base, and 18 inches square at the highest point. The vertical length of each post is 98 feet 6 inches from the base to the highest point, and they are composed of four angles each, diagonally braced on all four sides with flats and gussets, similar bracing being employed to connect the four corner posts into a main tower. Half way up each of the three sections into which the main tower is divided, a diaphragm of stiff angles and plates is introduced, thus giving the tower increased rigidity towards resisting torsional forces.



Electrical Tower Crane Designed and Erected by Geo. Anderson & Co., Limited

The base of the tower is 21 feet by 19 feet 6 inches section, and is carried on a six-wheel truck built of steel beams, angles and channels. A 10 h.p. motor is mounted on the truck and transmits power to the wheels through cut steel spur gears and worms, for travelling.

At the top of the first section, which is 39 feet from the ground, the operator's platform is situated. On this platform, two separate winches are stationed, each performing the hoisting operation and raising, lowering and turning of the jib on its own side of the tower. These machines are driven by individual motors of 20 h.p. each. All motions of the crane are controlled from the operating floor.

At the top of the second section, 75 feet from the ground, is a platform of rigid design, built of beams, angles and plates. This platform carries the sole plates, sockets and turning gear for the two jibs, on opposite sides of the tower.

The top of the tower has a rectangular section 6 feet 6 inches square, and is roofed over with steel plates. At the end of a cross beam carried at this point, are the steel links, together with the jib and hoist rope pulleys, so arranged that they radiate with the turning movements of the jibs. Each jib is of lattice steel construction, and measures 45 feet in length. They are both designed to swing through an angle of 180 degrees.

All points of the tower are reached by means of steel ladders which run between the different platforms in the interior of the structure. Twelve tons of ballast were used with this crane, distributed at the four corners of the travelling trucks, inside the corner posts, in lots of three tons each.

The crane is very easily handled. At the maximum radius of each jib, which is 40 feet, a load of 3 tons can be raised at the rate of 85 feet per minute, using the jibs simultaneously. At a 17-foot radius, the crane will hoist a load of 8 tons, the hoisting speed in this case being 36 feet per minute. The time taken to bring the jibs from the maximum to the minimum radius is 45 seconds, and to turn them through their greatest angle of 180 degrees takes 30 seconds. The travelling speed of this crane is arranged for 50 feet per minute.

This crane is doing excellent service in dispatch and placing of material, and in saving labor. A great feature in the use of a crane of this type is the freeway that obtains all over the building operation, doing away with all derrick obstructions, and allowing of the completion of the work from the ground up.

Longitudinal Reinforcement in Concrete Columns

At the recent convention of the National Association of Cement Users, a paper on the above subject was read by Sanford E. Thompson, consulting engineer, from which we take the following:

Of the three common methods of strengthening concrete columns, so as to reduce the size below that which would be required by an ordinary mixture of plain concrete— namely, a rich mixture, longitudinal reinforcement and hooping—each has its advantages and limitations.

By increasing the percentage of cement there is an increase in the strength of the concrete per square inch of section. By inserting vertical steel, this receives a share of the compression and thus permits heavier loading. By hooping or banding, the ultimate strength is increased and the column is rendered more ductile.

The writer has presented on previous occasions the limitations of hooping, which, although very effective, is increasing the ultimate strength of the column, does not greatly advance the point of the first beginning of the failure, because the hoops do not get into action until the concrete begins to crush and expand laterally, so as to put tension on the hoops. Columns with longitudinal reinforcement imbedded in them to reduce their size are apt to be more expensive than plain concrete columns of equal strength, but the [illegible] still [illegible] that vertical bars do not add to the strength of the column are absolutely unfounded by either theory or test. On the contrary, both theory and experiments show that the longitudinal reinforcement properly placed does actually increase the strength of the column.

The principle is very simple. When a load is placed on a column of any material whatever, it is shortened by a small amount, but this shortening within working limits is substantially in proportion to the load placed upon it; that is, if when a column of any homogeneous material at the working load is doubled the amount of shortening is also doubled. Now, if vertical steel bars are imbedded in concrete, they also must shorten with the concrete when the load is applied, and therefore they relieve the concrete of a portion of its load. It is physically impossible to prevent such vertical steel taking a part of the load unless the steel slips or buckles, and since the power of resistance of the steel bars to shortening is greater than that of the concrete, the load necessary to shorten them is proportionately greater than would be required for concrete of the same area. The action of structural steel reinforcement is similar, provided the bond between the steel and the concrete is perfect. This bond is more difficult to obtain with vertical structural steel than with vertical bars, and tests with latticed angle-bar reinforcement have indicated a less effective increase of strength with this structural steel than with vertical bars.

Considering then only columns with bar reinforcement, the question is whether these vertical steel bars do slip or buckle. Evidently they cannot slip if the ends are securely held by the concrete, and this is always the case if they are properly butted or lapped for a sufficient length. As to buckling, tests have proved conclusively that vertical bars, such as are used in columns, when imbedded in concrete will not buckle until the elastic limit of the steel is reached, and beyond this point, of course, no steel or other material is expected to do any service. Many of the tests at the Watertown Arsenal, for example, were made with vertical bars imbedded in columns 12 inches square and 8 feet long, with absolutely no loops or horizontal steel of any kind placed around these vertical bars to hold them in place; that is, the bars 8 feet in length were placed in the four corners of the columns—in some tests only 2 inches from the surface, and simply held in place by the 2 inches of concrete itself. There was no sign whatever of buckling until the compression was so great that the elastic limit of the steel was passed, when, of course, nothing further could be expected of it.

These tests at the Watertown Arsenal and, so far as the writer has been able to discover by examining all the experiments on record, all other tests of full size columns made in this country further bear out the fact that vertical steel bars imbedded in concrete increase the strength of the column, and it can be further shown that these tests bear out the theory by which the strength of the combination of steel and concrete may be computed and is computed in practice.

The Hassam Paving Company, of Worcester, Mass., have opened a branch office at 515 Quebec Bank Building, Montreal, in charge of Mr. C. M. Edwards. The company is among the large American sidewalk and street pavement contractors, and they have opened a Montreal office to look after their Canadian trade in the Provinces of Ontario and Quebec.

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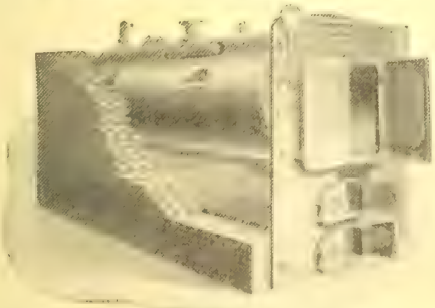

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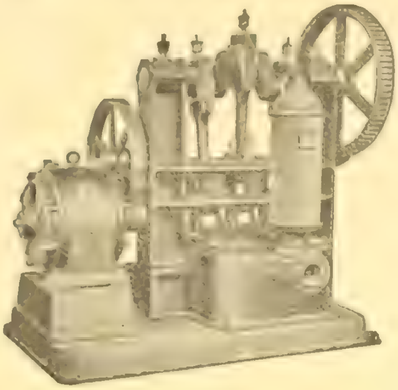

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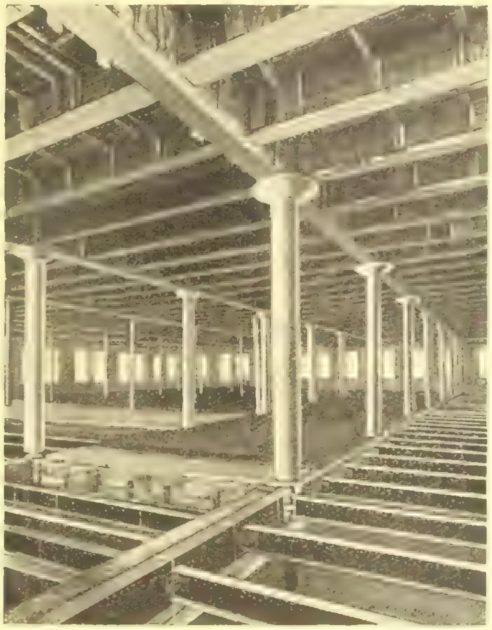

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104	Public Office Bldgs. Banks, Libraries, Halls and Theatres	3,540,001	412,848
50	Private Residences	[illegible]	[illegible]
38	United States Government	[illegible]	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	[illegible]	[illegible]
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	[illegible]	[illegible]
37	Prviate Stables	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and Fire Houses	208,664	28,837
656	Total 1st	12,800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	[illegible]	
717		[illegible]	

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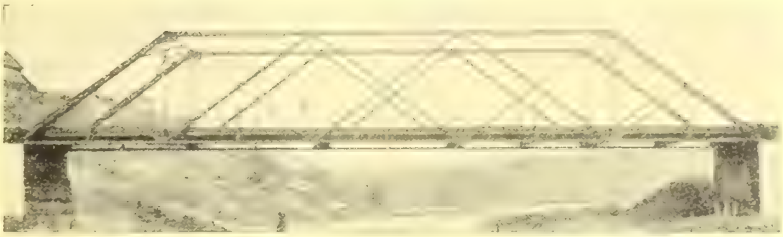

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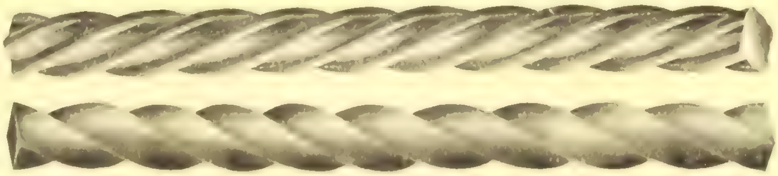

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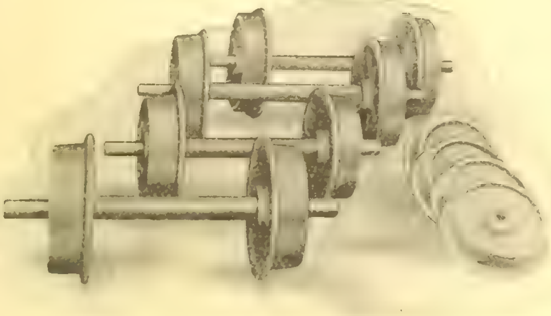

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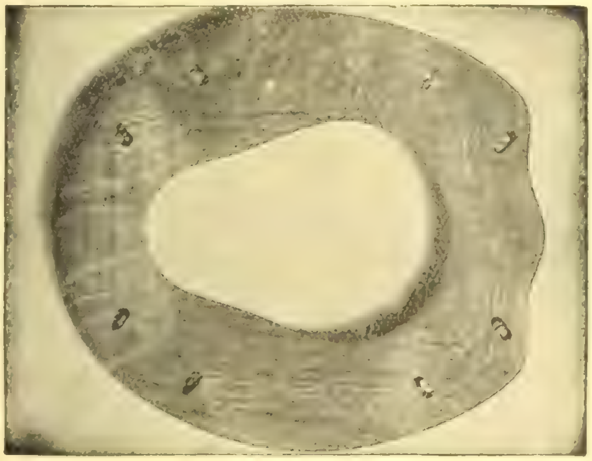
meet the demand for a closet seat that should always maintain its solidity, that should never under any circumstances come apart or split at the joints and that should possess sanitary perfection.



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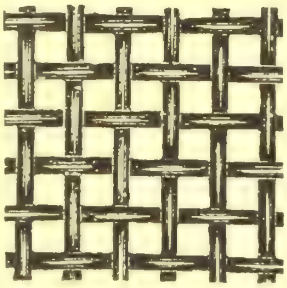

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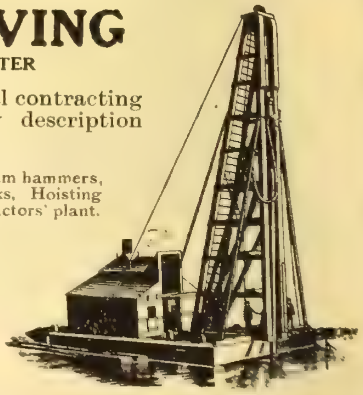

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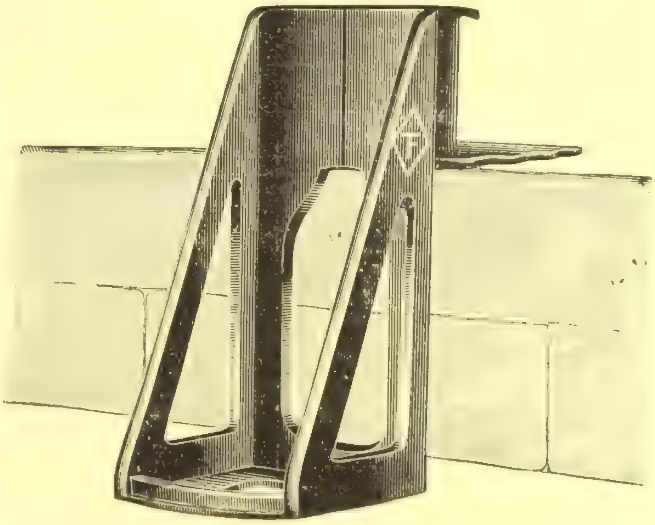

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Current Prices of Building Material.

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	Per M.
No. 1 dry pressed red bricks	$18.00
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Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, or foundation work	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D,D.
10 to 25 united inches	$4.25	$ 6,25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex. and 3-16-inch round, 35 cents per square foot up.
Floor Tile—½-inch square 45 cents.
Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 25 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish colors, firsts 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G, Cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

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Brass Goods, Valves, etc.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock..........net $1.65
No. 4½ Fuller's..........net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Furnaces 45 per cent.; registers 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.; other specials, 40 per cent.

Boilers—Galvanized Iron Range,

30-gallon, standard, $4.75; extra heavy, $7.00.

CastIron Sinks.

16 x 24, $1.00; 18 x 30. $1.15; 18 x 36, $1.95.

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⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
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Malleable Fittings—Canadian discount, 37½ per cent.

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Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

G. A. Grier & Son, lumber manufacturers, of Montreal, Que., have dissolved.

W. M. Johnston, builder, Carstairs, Alta., has been [illegible].

Armstrong Bros., Midland, Ont., have been succeeded by Armstrong Bros. & Frank.

W. L. [illegible] planing mill [illegible], Aurora Ont., have assigned to J. P. Langley, Toronto.

The B. C. Gazette gives notice of the following companies: Ward Electric Company Limited, capital $10,000; Sullivan Fireproof Wall & Partition Company, Limited, capital $40,0000; The Shortreed Shingle Company, Limited, capital $10,000; The British Columbia Ceiling & Roofing Company, Limited, capital $150,000; Fort George Power Company, Limited, capital $10,000; Atlin [illegible] Company, Limited, capital [illegible]

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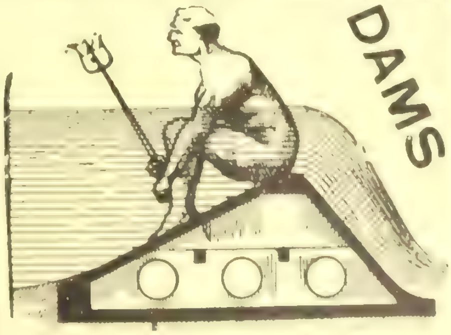

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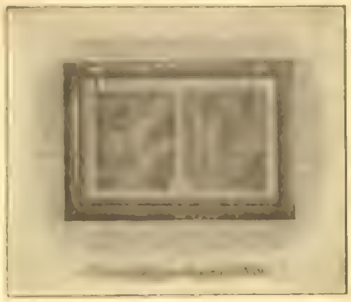

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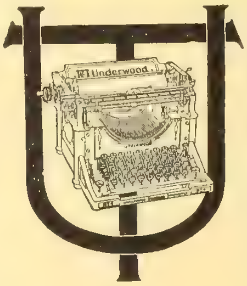

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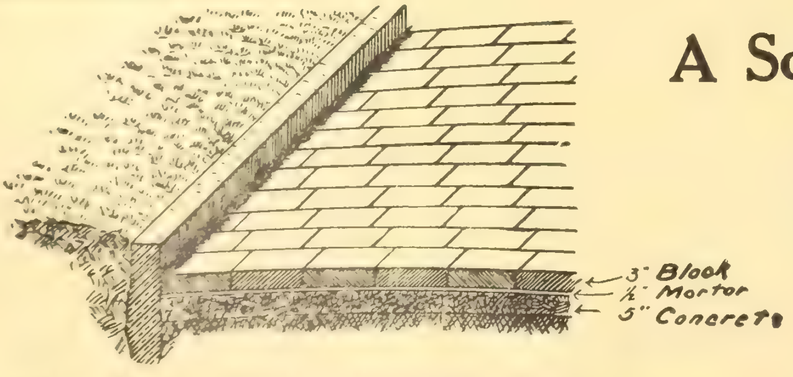

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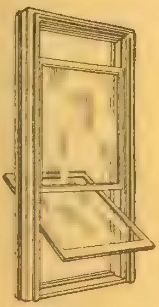

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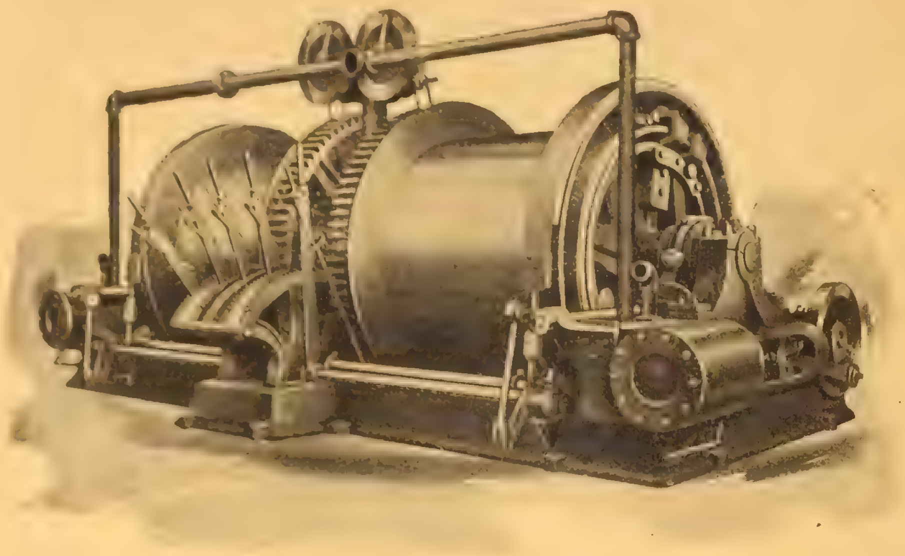

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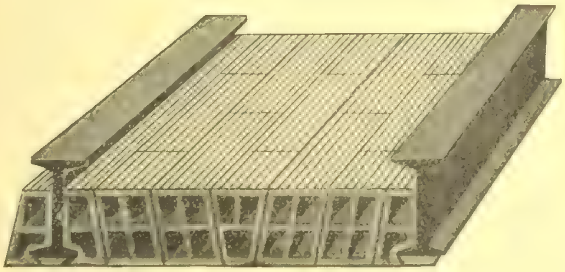
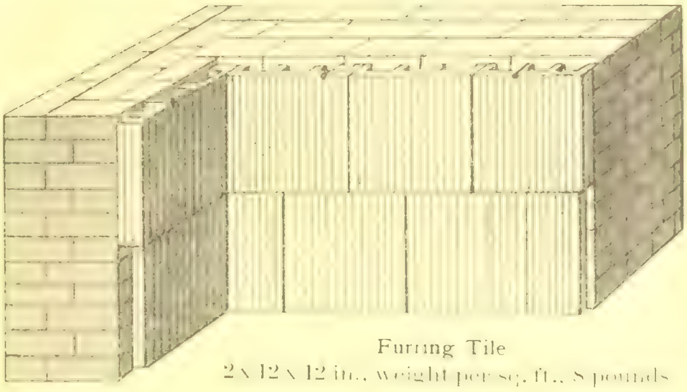


Perspective of Typical Arch



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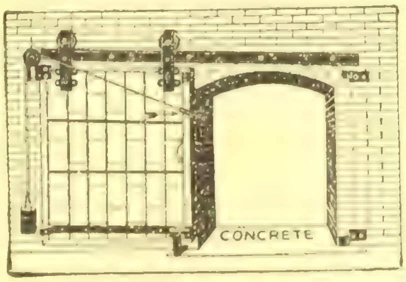

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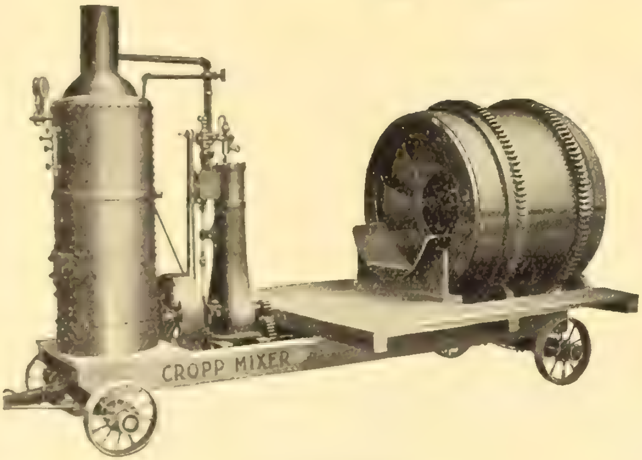
Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

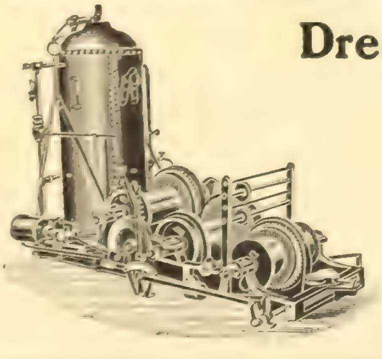
We are bringing out a small Mixer number "O" which holds a One, Two and Four mix. This Mixer is very light and portable—just the thing for small Contractors.

Our Prices
Will Interest You

The only Mixer that will not spill when overcharged

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

M. Beatty & Sons, Limited
Welland, Ontario, Canada



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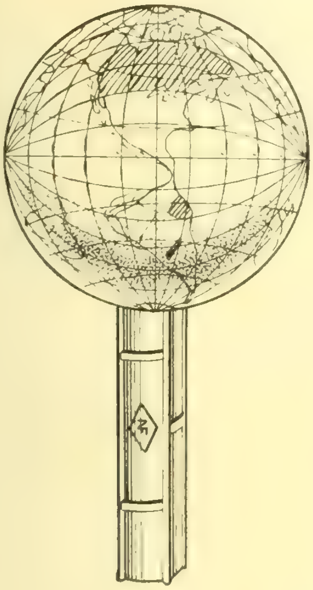
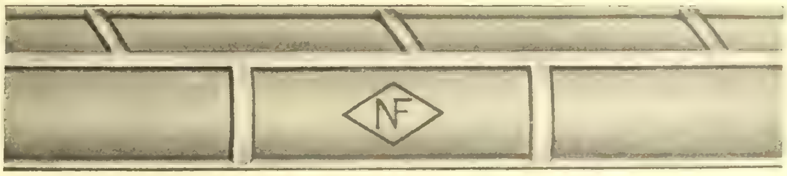
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

The Strength is in the Steel





Registered under the Trade Mark and Designs Act.

"NF" Reinforcing Bar for Concrete

is all made from **Bottom Cast** Open Hearth Steel which we make OURSELVES.

Each heat or drawing of metal is tested by chemical analysis to insure its hardness. The ingots are then rolled, and after rolling are subjected to **tensile tests.**

Any heat which does not show the requisite **tensile strength, elastic limit, elongation** and correct **reduction of area** is rejected by us.

The material for **most** concrete bars is too often simply **off heats** of steel which cannot be used for a better purpose.

If there is any definite value in the system of concrete reinforcement one of whose two bases is a **reinforcing metal,** OUR method is the only RELIABLE one.

It's a simple enough fact but worth bearing in mind in making up specifications that the STRENGTH is in THE STEEL, and that "NF" REINFORCING BAR has the STRENGTH because it has the STEEL.

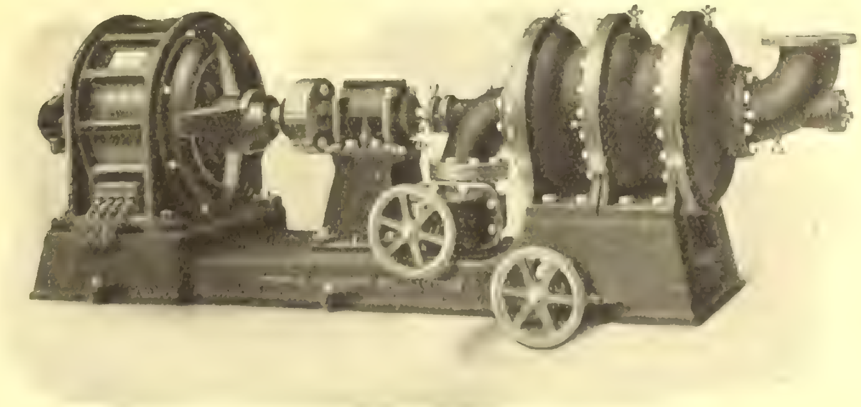
ONTARIO IRON & STEEL COMPANY, LIMITED
Toronto, Ont., Canada

Motor Driven Turbine Pumps

Simple

Reliable

Efficient



Made for

any

Service

These pumping units are especially adapted for municipalities desiring to utilize electric power for waterworks service.

CANADA FOUNDRY COMPANY, Limited
Head Office, TORONTO, Ont.
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

The Hamilton Steel & Iron Co. Limited
Hamilton - Canada

Rounds, Squares,
Twisted Squares,
Maxwell
Deformed Bar

Bar Iron
Pig Iron
Forgings
R.R. Splice Bars
Tie Plates, Spikes, Axles

STEEL BARS
for Reinforcing
Concrete

Toronto Pressed Brick and
Terra Cotta Works

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Send for Samples and Prices. Special and prompt attention given
to Architects' Terra Cotta Drawings

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Montreal Agent: E. F. DARTNELL, 180 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

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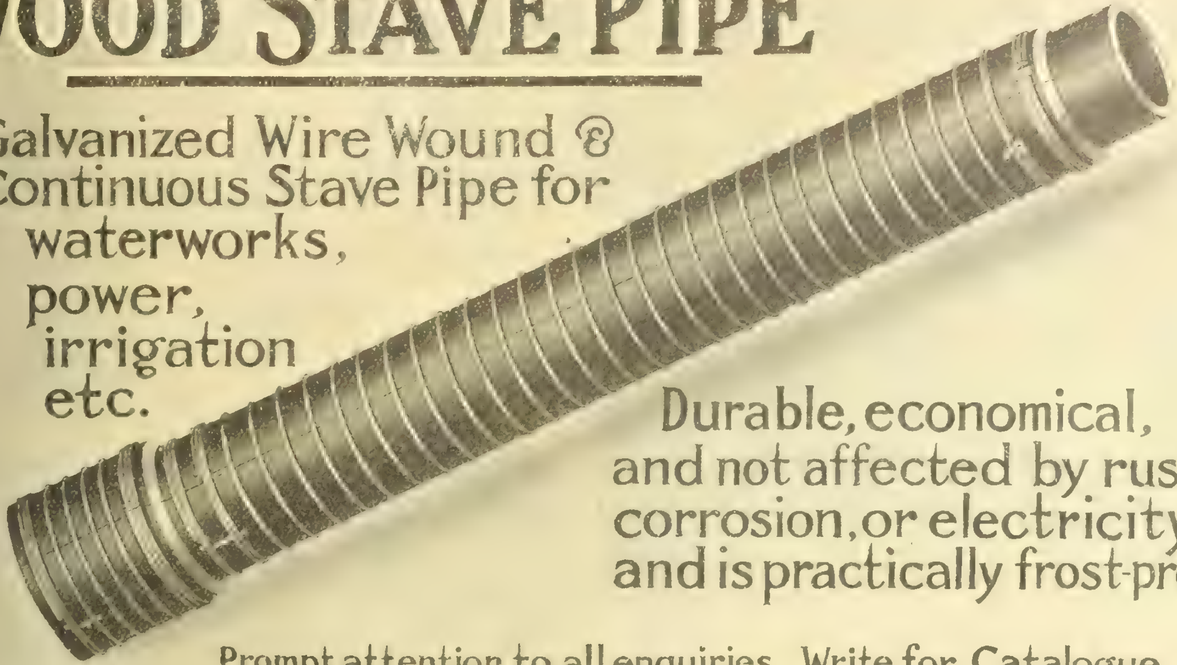
Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.



Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

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Brantford "Automatic" Batch Concrete Mixer

Two Sizes

The most up-to-date Mixer built

We also manufacture

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Our shipping facilities are unequalled.

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Good Sewer Pipe

is rather to be chosen than the lowest priced

We may not quote as low as some other fellows but the slight difference is more than made up in **Quality.**

If it makes no difference to you after the goods are buried, **Quality** counts anyway. Just look back over your experiences.

With the **Best Goods** wasn't there less breakage in handling, less trouble in laying and fewer arguments with inspectors?

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1910 Catalogue, handy for pocket, just ready

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We make nothing else

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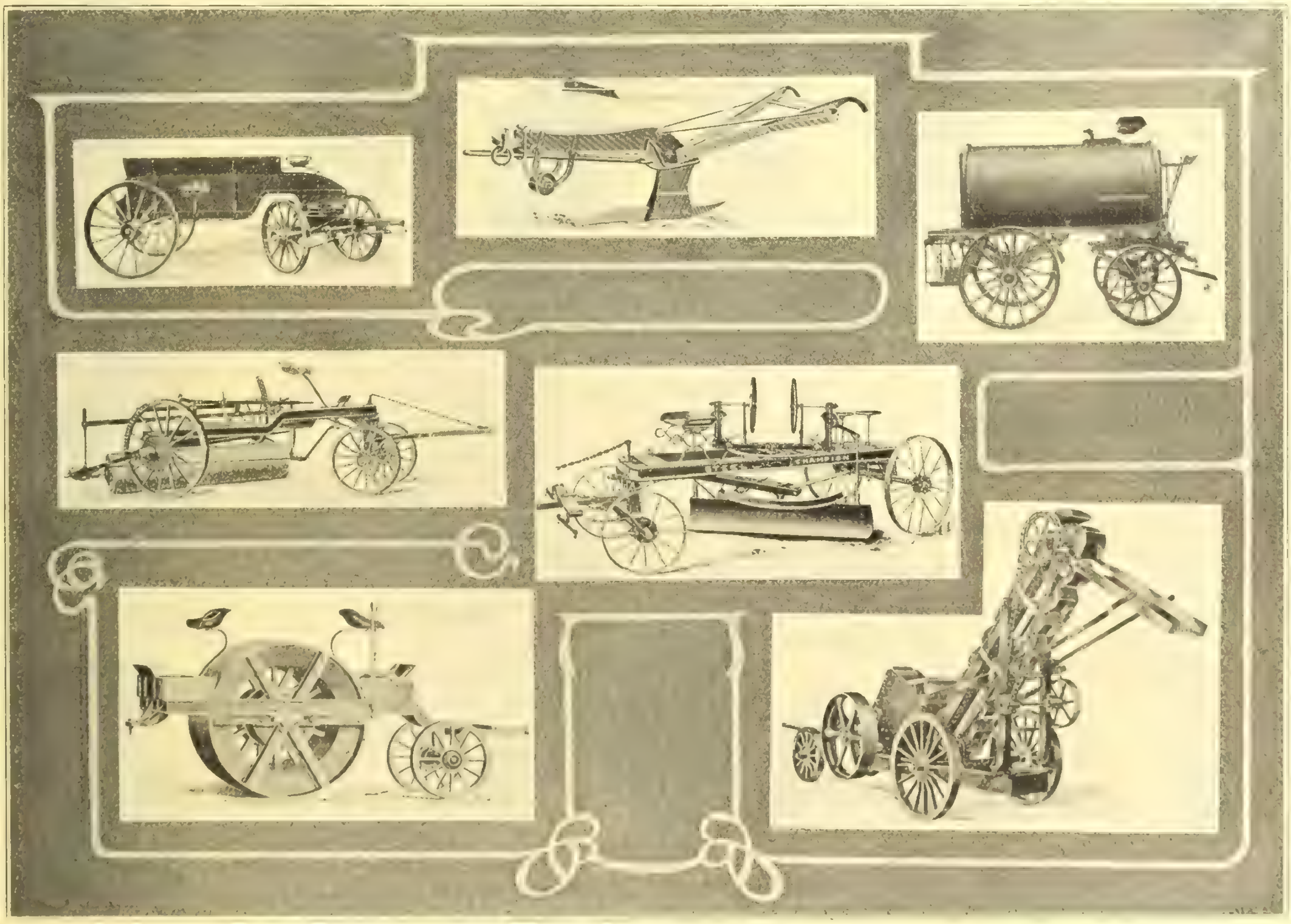

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American Road Machine Co. of Canada
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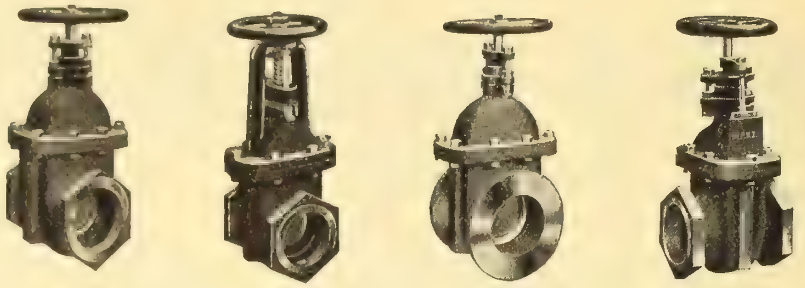
KERR

Valves and Hydrants

Water Crane and Hydrant Combination



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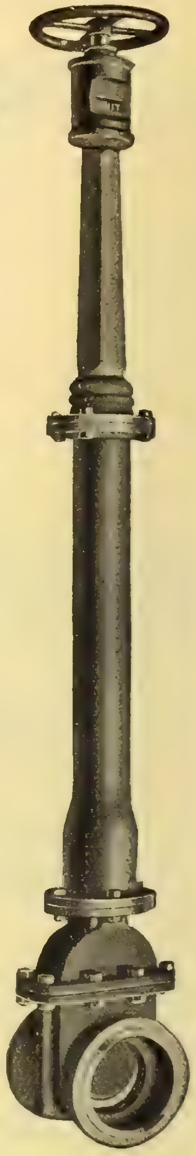
All our valves and hydrants are carefully made and finished and are suited to the purposes for which they are designed.

We make valves for power plants, heating systems of factories, office buildings and dwellings and waterworks systems, in fact for almost any service. We also manufacture several styles of valve boxes for waterworks valves and a large amount of the material used in connection with sprinkler systems.

When you think of **VALVES** think of **KERR** and the goods they manufacture. Those familiar with steam and water goods associate **KERR** with high-class valves and hydrants.

Valves are a specialty with us and every minute of our time is given to the subject.

There may be lower priced valves on the market, but it is not price alone that you are considering, you want valves that will give long and satisfactory service.



Indicator Post for Fire Protection Valve

"Weber" Gate (Brass)

Compression Hydrant

Hub End Gate

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Lombard
Street

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"Standard" in Canada

¶ In order to afford better accomodation to our customers and to facilitate quick delivery of **"Standard"** Plumbing Fixtures in Canada, a factory is in course of erection at Toronto which will be devoted exclusively to the manufacture of **"Standard"** Porcelain Enameled Ware.

¶ The machinery and equipment will be thoroughly modern in every respect, so that the high standard of quality that has always characterized **"Standard"** Goods will distinguish the product of our Canadian factory and the fixtures will carry the same well-known guarantee of excellence.

¶ For the convenience of architects, plumbers and contractors, a large showroom is maintained in Toronto, where **"Standard"** fixtures are displayed and an opportunity afforded to investigate the merits of our well-known product.

Standard Sanitary Mfg. Co.
Limited
General Offices
Pittsburgh, Pa., U.S.A.
Toronto Showroom and Office
Lombard Street and 59 Richmond Street, East

Railway Engineers and Contractors

Timber culverts rot, clay pipe culverts break from frost or weight, metallic culverts rust and are woefully dear, CONCRETE CULVERTS LAST FOREVER and the price is relatively low.

The only absolutely **durable and frost-proof** culvert pipe is

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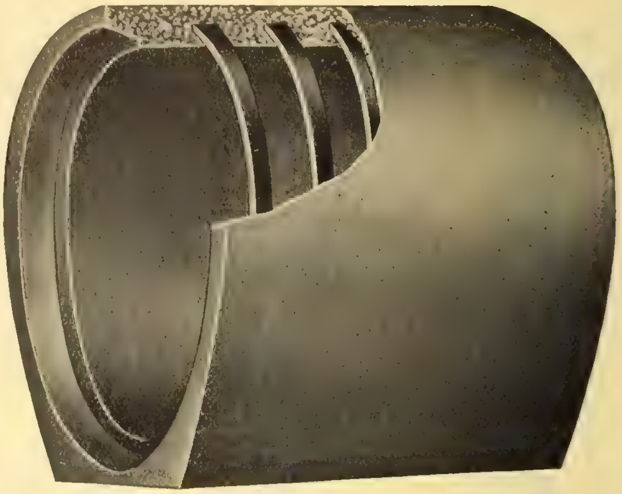


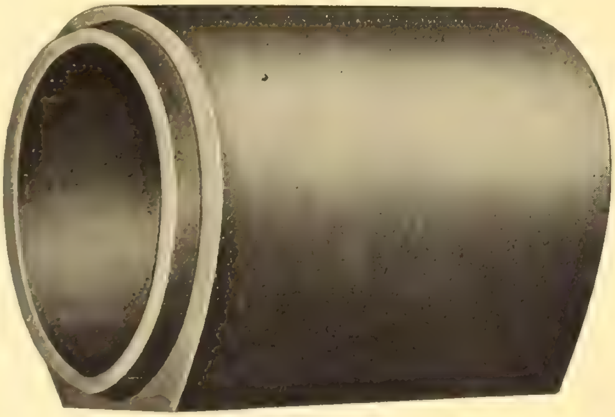
36″ Section

of **first quality.** The prime requisites of first quality concrete are **good raw material, proper proportions,** and **scientifically correct methods.**

We possess all these in the highest degree. Our years of experience, our facilities, and our raw material enable us to make **good concrete** and make it **always good.**

Nowadays the railway engineer must get results in **permanency** as well as in other matters. The contractor too must get results if he is to stay in the game. A very important result to him is the **economy** of buying material that **holds out,** that can be handled with **facility,** and that can be procured **promptly** and at a **reasonable price.**

Don't imperil your interests by using non-durable material, or by trusting to the random hits and misses of a novice when you can buy **durable, mature,** and **guaranteed concrete pipe,** from a long-established and reputable firm.



30″ Section

Mature Stock

Prompt Shipment

Quality Guaranteed

No Loss From Breakage

Low Prices

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Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO

MISSISQUOI MARBLE

The demand for our material, not only in Canada, but in the United States as well, has grown so much faster than our most sanguine expectations permitted us to hope, that we are again obliged to make very large additions to our plant.

Contracts have been let for twelve additional gang saws, as well as larger engines, and increased boiler capacity. These additions should be complete by the middle of May, and we shall then be able to handle promptly a very much increased volume of business.

We appreciate the support we have had from a very large number of the leading Architectural offices, and we are using our utmost endeavors to merit it.

The Missisquoi Marble Co., Limited
Phillipsburg, Quebec **Coristine Building, Montreal**

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Send us your blue prints and we will be pleased to submit lighting recommendations for all classes of buildings.

Our Illuminating Engineering Department is at the service of Canadian Architects, Consulting Engineers, and Electrical Contractors.

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Waterworks Construction

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Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

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All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

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It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

Don't forget these points when letting your contracts.

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Limited
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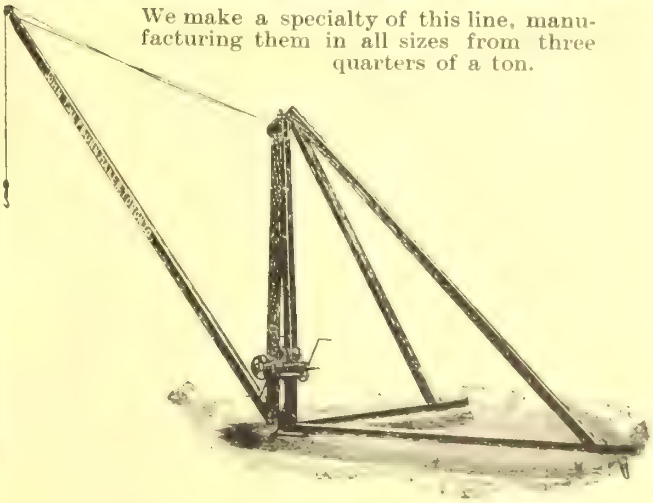
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds
Prices on application

JOHN T. HEPBURN
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"Galt" Steel Shingles

"Not the First Shingles but the first Perfect Shingles."

INVENTED and manufactured by men of life-long experience in the metal-shingle business, the new "Galt" Shingle combines all of the strong points and overcomes the weaknesses of ordinary metal roofings. The only metal shingle with locks so tight that light cannot penetrate them—consequently, the only shingle that *must be water-tight.* Top and side nailing-flanges. Handsome Gothic Tile design.

If you are at all interested in roofing material you should have our booklet "ROOFING ECONOMY," just off the press. *Name and address, please?*

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Galt - Ontario
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Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

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Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

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"The Best Goods Come in Small Packages"

Sometimes people ask why

Perfection Wire Mesh

(for Concrete Reinforcement)

weighing less and consequently costing less than other concrete reinforcement will give the same strength.

It is the quality of the wire. It is made from a special grade of high carbon cold drawn wire having an elastic limit of 110,000 lbs. per square inch. It **has to be perfect** wire. It would break while being cold drawn if it wasn't.

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We have long appreciated the fact that price is not the only requisite an architect, builder or contractor must seek in placing his order for doors. Poorly manufactured doors can scarcely be considered a bargain at any price.

Door Making is our Specialty

We have equipped our plant with the best door machinery made, and turn out doors that are right in quality and right in price.

Our doors need no commendation. They prove themselves.

Prompt deliveries. Write for prices.

Wholesale or retail dealers in lumber, doors and trim.

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Made from the purest rock-transforming shale in the world. The shale is ground—is sifted and moulded under enormous pressure—and is dried, "burnt," and "flashed" in latest downdraft kilns. The result is the hardest, smoothest and cleanest brick known—capable of many beautiful colors and "flashings." Let us send you samples and prices.

Head Office: Milton, Ont. Toronto Office: Janes Building

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T. A. MORRISON & CO., 204 St. James St.

A Great Favorite

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Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
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Home Bank Building - Toronto, Ont.
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Dry Pressed Brick

The Dry Pressed Brick is the most artistic up-to-date permanent building material on the market. Architects and Contractors agree on this. We are manufacturing best colored, most uniform Brick on the market.

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AUTOFORCE VENTILATING SYSTEM

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

Sole Licensees and Manufacturers for Canada:

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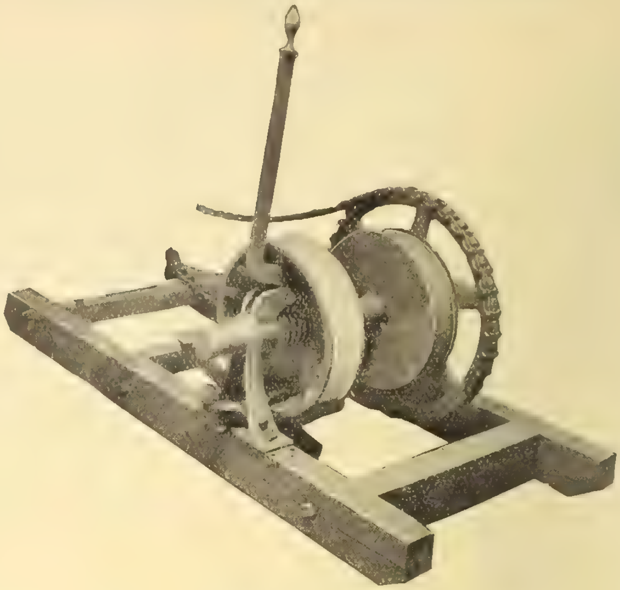

Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	Mortar Conveying	Well Digging
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This hoist can be used with any make or style of gas, gasoline or oil engine

The Scott Machine Company, Limited

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TORONTO

Largest manufacturers of

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All Sizes

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for Water, Gas, Culvert and Sewer

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for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

For rates and other particulars, write

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We carry a stock of above materials in Montreal and are prepared to supply the trade at lowest prices.

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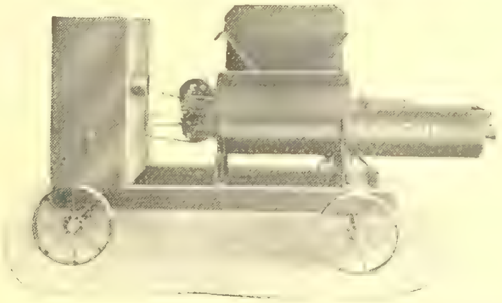
London Standard Drum Batch Concrete Mixer



The very latest ideas and improved plans of construction are embodied in this machine. CONTRACTORS it will be well worth your while to write for full particulars.

We Can Save You Money {
On the first cost of machine
Cost of maintainance
Cost of producing concrete

This machine is manufactured in several sizes and with every equipment desired, Let us tell you all about it. State capacity required when writing. We also manufacture the now famous LONDON AUTOMATIC BATCH MIXERS No. 1 and No. 2 Face down Concrete Block Machines, Cement Brick Machines, Power Cement Drain Tile Machines, Hand Cement Drain Tile Machines, Sill and Lintel Molds, Ornamental Molds, Cement working Tools and a full line of Concrete Machinery.

The London Concrete Machinery Company
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We are the Largest Manufacturers of Concrete Machinery in Canada.

Handsome Ornamental Work
Made of Cement

This class of work and work of every day kind in the Concrete Industry is carefully edited for the interest of the trade every month in

THE
CEMENT ERA

If interested in reinforced concrete building, cement block manufacturing, tile making, concrete paving, ornamental cement work, waterproofing, fireproofing, etc., read **The Cement Era.** The price for subscription is $1.50 a year. Ask for sample copy.

The Cement Era Publishing Co.
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"Empire Brand"

ensures a perfectly smooth hardwood floor which will be "a thing of beauty and a joy forever." If you want your clients to speak of you as "a fellow who always uses the best materials obtainable," specify

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every time.

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Orillia, Ontario

Montreal Agent: THE HARDWOOD FLOORING CO.
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"Inglis" Corliss Engines

are known above all others as being pre-eminently "Engines of Quality," Economical, Durable and Reliable and can be depended upon to give the same good results twenty years from now.

We build them Single, Tandem, Compound and Triple, for heavy or light duty. Remember our thirty-five year reputation is back of every "INGLIS" engine. Specifications and prices upon request.

The John Inglis Company
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14 Strachan Avenue - - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Alexandria, Ont.

Tenders are being called by this municipality until May 16th for macadamizing, etc. See advertisement in this issue.

Brampton, Ont.

Tenders will be received until May 16th for the following debentures: $2,600 30-year sewer construction; $33,849 30-year local improvements; $15,224 20-year sidewalks and local improvements. These debentures all bear 4 1-2 per cent. interest. J. Blain, town clerk.

Carlyle, Sask.

A by-law will probably be submitted to raise $20,000 by debentures for the installation of a water supply.

Chilliwack, B.C.

The by-law to raise debenture loan of $10,000 for the purpose of road improvement was defeated.

Delta, B.C.

Tenders will be received until May 13 for $135,000 waterworks debentures.

Dauphin, Man.

Tenders are being received until May 16th for purchase of 2-year 5 per cent. debentures to raise $75,000 for waterworks and sewers. J. W. Johnston, secretary-treasurer.

Fernie, B.C.

The issue of debentures for $41,000 for extension of sewerage system was not authorized on the 5th inst. Those for the improvements of streets and for surface drainage were ratified.

Fredericton, N.B.

City Engineer Feeney and Ald. Mitchell. chairman of the roads and streets, are going to Somerville, Mass., and other towns, to inspect the methods of making tarvia pavement.

Ingersoll, Ont.

A by-law to expend $55,000 on the waterworks was carried.

Mariposa, Ont.

A by-law has been passed to issue $3,850 drainage debentures. Jesse B. Weldon, clerk.

Montreal, Que.

The Private Bills Committee of the Quebec Legislature has authorized the city to borrow $5000,000 for the establishment of a filtration plant.

Tenders will be received until May 18th for the construction of sewers as follows: Sherbrooke street, 3rd section, from St. Lawrence boulevard to Bleury street; Sherbrooke street, 6th section, from Drummond street to Guy street; Laurier Ward, main sewer, from St. Lawrence boulevard to St. Laurent road and along St. Laurent road to sewage farm. John R. Barlow, city surveyor.

The city waterworks department will install a new six million gallon turbine pump during the present season at a cost of approximately $30,000.

North Toronto, Ont.

A by-law authorizing the issue of debentures to the amount of $25,000 will be submitted on June 4, to extend the waterworks system, etc.

Ottawa, Ont.

Tenders addressed to the Chairman of the Board of Control will be received until May 12th for asphalt pavement on Bank and O'Connor streets. Specifications, etc., at office of City Engineer Ker.

Tenders addressed to the chairman, Waterworks Committee, will be received until May 31 for supply and delivery of ten 42 inch cast iron flexible joints. Plans, etc., at office of City Engineer Ker.

Orillia, Ont.

Tenders are being called by this municipality until May 16th for sewage sedimentation tanks. See advertisement in this issue.

Outremont, Que.

Tenders addressed to J. Kruse, secretary-treasurer, will be received until May 18th for the construction of 3 x 4 1-2 foot trunk sewer on Pacific avenue, Durocher street, Van Horne avenue, to Outremont avenue, about 3,200 feet; 3 x 2 foot sewers on de l'Epee street, from Laurier avenue to St. Viateur street, about 1,800 feet; 3 x 2 foot sewer on Maplewood avenue, about 800 feet. Plans and specifications may be seen at the town hall.

Prince Albert, Sask.

Tenders are being called by this municipality for sewer extensions. See advertisement in this issue.

Tenders were received for construction of $10,500 lineal feet of concrete sidewalk as follows: J. Craig, Prince Albert, 18c.; Western Pavers, Limited, Winnipeg, 18 1-2 cents; City Engineer, 17 cents. The pavement will be constructed by day labor.

Prescott, Ont.

Tenders are being called until May 21st for construction of sewers, etc. See advertisement in this issue.

Peterborough, Ont.

The Peterborough Hardware Company will supply cement at $1.65.

A by-law will be submitted to raise $30,000 for sewage and drainage purposes. T. A. S. Hay, city engineer.

Port Arthur, Ont.

Those who tendered on the paving were the National Paving & Contracting Company of Winnipeg, the Waren Bituminous Paving Company of Toronto, and Messrs. Stewart & Hewitson, of Port Arthur. The National Paving Company quoted prices on sheet asphalt, while Messrs. Stewart & Hewitson quoted prices on sheet asphalt and block asphalt. The Warren Bituminous Paving Company figured for concrete block paving.

St. John, N.B.

Comptroller A. P. Macintyre is calling for tenders until [illegible] for street pavements. (See advertisement in this issue).

Engineer Murdoch has been instructed to call for tenders for water mains. Estimated cost, $38,000.

St. Catharines, Ont.

Tenders addressed to Chairman of the Committee of Works will be received until May 12th for the construction of sewers. D. Benzie, city engineer.

Stratford, Ont.

City Engineer Ferguson estimated the cost of the proposed pavements at $122,379.71.

The city council is considering a paving scheme involving $122,379. Details follow: Birmingham, Gore to St. Andrew, Taralithic, $13,233.05; St. Patrick, Erie to Birmingham, Taralithic, $2,545.97; Cambria, Erie to Front, via Gore, Westrumite, $22,477.76; Wellington, St. Patrick to Cambria, brick, $10,693.40; Waterloo, Ontario to Mornington, brick, $12,112.17; Albert, Waterloo to Front, Westrumite, $9,447.58; Albert, Front to King, Westrumite, $10,935.78; Brunswick, Waterloo to Front, Westrumite, $8,972.52; Water, Nile to Queen, Westrumite, $9,114.05; Nile, Ontario to Water, brick, $3,229.64; Front, Ballantyne to Shakespeare, brick, $19,617.79. Total, $122,379.71.

Toronto, Ont.

The Board of Control are calling for tenders until May 17th for asphalt, bitulithic, vitrified block, asphalt block concrete pavements; concrete curbs and walks and sewers. G. R. Geary, chairman.

Virden, Man.

Tenders are being called by this municipality for construction of cement sidewalk, also supply of cement. See advertisement in this issue.

Vancouver, B.C.

City Engineer Clements' plans for extensions for section south of False Creek have been approved by the Board of Works.

Winnipeg, Man.

Tenders are being called by the Board of Control until May 19th for construction of asphalt pavements on the following streets: Market avenue, Lombard avenue, McDermot aveuue, Gunnell street, Tecumseh street, Henry avenue, full width on Rietta street, Louise street, Harvard avenue, Dromore avenue, Ethel avenue, Yale avenue, Academy road, Walnut street, Livinia avenue, Ellice avenue, McGee street, Purcell street, Charles street, Grove street, Derby street, Salter street, Boyd avenue, Inkster avenue, Aberdeen avenue.

AWARDED.

Annapolis Royal, N.S.

J. Avord Beel, of Bridgetown, has been given the contract for the construction of a wood stove pipe flume, 49 inches in diameter and 600 feet long, at $[illegible]. The Pedlar People offered to install a 14 gauge galvanized iron 48-inch flume for $3,000.

Chatham, Ont.

J. M. Graves, of Cleveland, Ohio, was given a contract by Chatham Township to the construction of large outlet drainage works. The tenders were as follows: E. M. [illegible], Cleveland, Ohio, $[illegible]; Gilmour Bros., Toledo, Ohio, $28,989; Chatham Dredging Company, Chatham, $30,200; Windsor Dredging Company, Windsor, $[illegible]; Connolly & McDonnell, Stratford, [illegible].

Moose Jaw, Sask.

W. F. Heal, city clerk, sends us the following information regarding the awarding of contracts on May 2nd for trenching and laying [illegible] feet of sewer pipe. P. Kilkenny, of Moose Jaw, was awarded the contract at $9,822. H. G. McVean, also of this city, tendered at $11,398. This was erroneously reported in issue of April 27th.

It is stated that the council have accepted the tender of Kettle River Company for 3-inch creosote wood blocks, 16 pound, at $[illegible]

North Battleford, Sask.

The contract for the cast iron pipes for the waterworks extension was awarded the Canada Iron Corporation, Limited, the contract for the hydrants and valves to the Canada Foundry Company, Limited, and Wm. Newman & Company, of Winnipeg, secured the contract for the trenching, pipe laying and filling for the waterworks and sewerage extensions. The amount to be expended on this work, together with the McManus contract, which was completed last year, will amount to $50,000.

Ottawa, Ont.

N. Lett, secretary, Board of Control, sends us the following list of tenders for asphalt pavement on Wellington street, from Queen to Broad streets: Barber Asphalt Paving Company, $22,190 (accepted); Union Construction Company, Ottawa, $23,197; Ottawa Construction Company, Ottawa, $24,000; City Engineer, $24,[illegible].

Saskatoon, Sask.

The following tenders were received for concrete sidewalks: The Western Pavers, Limited, Winnipeg, $56,395 (accepted); Forest City Paving Company, Regina, $56,512; Saskatoon Concrete Company, Saskatoon, $69,360; Batchelor, Marshall & Skarin, Calgary, $76,332.50.

Selkirk, Man.

The contract for concrete walks, amounting to eight thousand dollars, was awarded to the Western Pavers, Limited, of Winnipeg.

Sault Ste. Marie, Ont.

C. J. Pim, town clerk, sends us the following list of tenders for cement walks: D. Jamison, Sault Ste. Marie, for the whole, $26,240.87; for Section A, $18,870.89; for Section B, $14,369.98. W. H. Harvey, Deseronto, for the whole, $25,843; for Section A, $10,790; for Section B, $13,063. Maple Leaf Artificial Paving Company, Simcoe Ont., for the whole, $21,445; for Section A, $10,500; for Section B, $14,500. McPhail & Wright, Sault Ste. Marie, for the whole, $24,000; for Section A, $11,473.56; for Section B, $13,723.33. Town Engineer, for the whole, $25,170; Section A, $11,430; Section B, $13,740. Contract was given to the Maple Leaf Artificial Stone Paving Company at $21,445. This company had contract last year and gave good walks.

Railroads, Bridges and Wharves

Arichat, N.S.

Tenders addressed to N. Tessier, secretary, Department of Public Works, Ottawa, will be received until June 2nd for the construction of wharf and warehouse here. Plans, etc., at above department, and at the offices of C. E. W. Dodwell, district engineer, Halifax; E. G. Millidge, district engineer, Antigonish, N.S., and on application to local postmaster.

Colchester, Ont.

Tenders addressed to N. Tessier, secretary, Department of Public Works, Ottawa, will be received until June 3rd for the construction of an extension to the pier here. Plans, etc., at above department and at the offices of H. J .Lamb, district engineer, London; J. G. Sing, Toronto, and on application to local postmaster.

Florenceville, N.B.

Tenders are being called by the Department of Public Works until June 13th for constructing superstructure for bridge. Plans at above Department. John Morrissy, Chief Commissioner, Fredericton, N.B.

Foxwarren, Man.

A by-law authorizing the council to borrow $5,000 to build a bridge over the Assiniboine river at Lazare was carried on the 3rd inst.

London, Ont.

Arthur E. Hourd, business agent for the C. P. R., has closed a deal for over $100,000 worth of land in the east end near Quebec street, which will be used for shops, roundhouse, station, office buildings, etc. The company are also arranging for a downtown station. Besides these schemes there is a rumor that the C. P. R. will acquire the London & Port Stanley Railway.

Montreal, Que.

Thos. J. Drummond, president of the Lake Superior Corporation, is authority for the statement that the Algoma Railway will probably be extended 150 miles to connect with the C. P. R. Probable cost, about $4,000,000.

Ottawa, Ont.

The C. P. R. has filed plans involving an outlay of about $1,000,000 for an underground line through the city connecting the Central Station near the foot of the Rideau Canal with the company's union station in the northwestern part of the city.

Port Hope, Ont.

It is announced that the C. N. R. will run into Port Hope the station being on Ontario street.

Quesnel, B.C.

Hon. Thos. Taylor is reported as having stated that the erection of steel bridge over the Fraser river will be proceeded with immediately.

Sherbrooke, Que.

The double tracking the Grand Trunk eastward will be continued from St. Rosalie to Richmond and this city. Engineers are now at work gathering data as to the bridge and other mechanical work necessary.

Vancouver, B.C.

Two survey parties, under Mr. J. Early, will start locating a portion of the proposed line of the British Columbia & Alaska Railway Company, which was incorporated at the last session of the Provincial Legislature. R. Smith and H. B. Robertson, Vancouver, who are interested, are representing New York capitalists.

Winnipeg, Man.

R. J. McKenzie is authority for the following outline of proposed work for the C. N. R.: Oak Point branch to be extended 70 miles (Cowan Construction have contract); Greenway and Wakopa branch extended to Deloraine, contract awarded; Goose Isle branch, 25 miles; Ochre river line, some 70 miles up west short of Lake Manitoba.

AWARDED.

Montreal, Que.

The Atlantic, Quebec & Western Railway have given to the Dominion Bridge Company a contract for all the steel superstructures on the line.

Vancouver, B.C.

R. G. Hutchinson has been awarded the contract for the construction of traffic bridge across the east branch of the Squamish river above Newport.

Woodstock, Ont.

F. J. Ure, county engineer, sends us the following list of tenders for bridges and arch, Plattsville: The Hunter Bridge & Boiler Company, Kincardine, $3,200, for steel and concrete floor abutments $776 (accepted). Other tenders: A. Hill & Company, Mitchell, $2,785, without floor, bridge not up to specification; Petrolia Bridge Company, $3,850, without floor; R. McManus & Company, Hamilton, $3,393; Hamilton Bridge Company, $3,300, without floor. Concrete arch: M. M. Hiles, Atwood, $898 (accepted). Other tenders: T. J. & W. Bezley, $1,539; Andrew Bain, Embro, $1,052; Pipe & Campbell, Ayr, $1,097.

Winnipeg, Man.

It is reported that the contract for the construction of the steel portion of the Pembina street subway has been awarded to the Dominion Bridge Company at $32,000.

N. Boyd has been awarded the contract for extension of Greenway and Wakopa branch for the C. N. R.

Public Buildings, Churches, Schools, etc.

Aylesford, N.S.

F. M. McMahon, who received tenders until April 30th for erection of Methodist Church here, writes that plans will likely have to be modified owing to tenders received being too high.

Brandon, Man.

There is every likelihood that a new opera house will be erected here this summer. Local capitalists are interested.

Calgary, Alta.

It has been decided to submit a by-law for $100,000 to be used in the building of the Calgary university.

Chatham, N.B.

Construction work on the new hospital building is being carried out by day labor. Tenders may possibly be called at a later date for several trades. Wm. E. Doran, architect, Montreal.

Cranbrook, B.C.

A by-law will be submitted to authorize the sale of joint government and municipal buildings, and the proceeds thereof to be devoted to purchasing a site and erecting new municipal buildings.

Eastview, Ont.

The by-law to issue debentures for $12,000 for new school has passed its third reading.

Brechin, B.C.

Tenders for school house here will be received until May 19th by the Minister of Public Works, Victoria, for the erection of a school house here. F. C. Gamble, public works engineer.

Fernie, B.C.

The expenditure of $7,000 on schools was ratified by the ratepayers.

The congregation of Christ Church, Anglican, are contemplating erecting a church shortly.

Headingly, Man.

Tenders addressed to C. W. Johnstone, secretary-treasurer, will be received until May 21st for the erection of school here.

Humboldt, Sask.

The town is having plans prepared for a town hall.

Moose Jaw, Sask.

The city council of Moose Jaw has decided to grant $25,000 towards a farmers' market building in the city.

Tenders addressed to the hospital board will be received until May 12th for all work in connection with the erection of a Nurses' Home here. Elliott & Gorman, architects.

Messrs. Barney Groves, of Regina, and H. Humber, of this city, have submitted a plan for the erection of a theatre. Probable cost about $35,000.

Mimico, Ont.

Tenders are called until May 14th for erection of brick school. E. J. Lennox, architect. See advertisement in this issue.

Midland, Ont.

Competitive working sketches are being called until May 28th for 4-roomed brick public school. See advertisement in this issue.

Montreal, Que.

A building site has been purchased on St. Catherine street, near Snowdon Junction, on which a home and school for the Hebrew orphan children will be erected. Estimated cost, $50,000. Those interested, Messrs. Mortimer B. Davis, Mark Workman, M. Vineberg and A. Pierce.

Mr. Jos. Denis is the lowest tenderer at $45,400 for the construction of the new Baril School of the Hochelaga School Commissioners.

The Syrians of Montreal are contemplating the erection of a Greek Orthodox Church, "The St. Nicholas," and are asking the Quebec Legislature for incorporation.

The National A. A. A. are considering the purchase of grounds at present under lease and erecting thereon a suitable club house. Mr. A. Lecours, president; H. Lebeau, secretary.

North Toronto, Ont.

A by-law to issue $17,000 school debentures will be submitted to the ratepayers shortly.

Niagara Falls South, Ont.

Tenders will be received until May 21st for the purchase of $12,000 public school debentures at 5 per cent. J. E. Jones, township clerk, Box 201.

Orillia, Ont.

The Presbyterian Church have sanctioned the expenditure of $35,000, part of which will be used on the erection of a new Sunday School building.

Outremont, Que.

Messrs. Gauthier & Daoust are preparing plans for a very extensive college building to be erected here for the Jesuit Order. It is not definitely decided whether the work will be proceeded with this year.

Ottawa, Ont.

The Board of Control has recommended the purchase of a site on Cumberland street for the fire hall.

Tenders closed on May 11th for the several trades required in the erection of church for Bell Street Methodist Church. Plans, etc., at office of J. P. MacLaren, architect, 104 Sparks street.

St. Hyacinthe, Que.

Tenders will shortly be asked for the construction of a three storey brick extension, 100 feet by 50 feet, for the Patronage St. Vincent de Paul. J. O. Turgeon, architect, 55 St. Francois Xavier street, Montreal.

Simcoe, Ont.

A joint meeting of the town council and public library board was held last week to discuss the site for the proposed new library building.

Toronto, Ont.

Tenders are being called until May 13th for several trades required in the erection of Oakwood High School; alterations to Joseph Workman School and to St. Clair Avenue School. See advertisement in this issue.

A new school is being urged by the Spadina Heights Ratepayers' Association. Mr. Bradshaw, secretary.

Permit has been issued to Yonge Street Methodist Church, $45,000.

Victoria, B.C.

Plans are being prepared for the new theatre. Estimated cost, $85,000. Manager, G. A. Calvert.

The Government are looking for sites for a border line isolation hospital to be erected in the vicinity of Phoenix. Another such hospital will probably be located at or near Kamloops.

Vancouver, B.C.

The Exhibition Association have decided to erect a new Machinery Hall. Estimated expenditure, about $20,000. Mr. Roy, secretary.

Permits were issued to the Central Mission for a six storey block, $75,000; also to the Salvation Army for servants' home, $7,000.

Winnipeg, Man.

The Assiniboine Lawn Bowling Club will erect a club house at an estimated cost of $3,000. Directors, J. T. Haig, Dr. H. S. Anderson and others.

Competitive plans are invited by the building committee of the St. Charles Country Club for the new club building. E. H. Macklin, secretary. W. Percy Over, 47 Canada Life Building, secretary Manitoba Association of Architects.

The following are some of the members on the building committee for Westminster Church; Charles Hyslop, William Brydon, J. H G. Russell, architect, has submitted plans.

AWARDED.

Brandon, Man.

The contract for the erection of the new Knox Presbyterian Church has been awarded to John Forbes, this place.

Bedford, Que.

Tenders for the erection of a Roman Catholic Church have been awarded as follows: Masonry, Elkins & Norris; wood work and other trades, Verrett & Desautels, of Sherbrooke, Que. Estimated cost of same, $30,000. J. O. Turgeon, architect, 55 St. Francis Xavier street, Montreal.

Beaverton, Ont.

Messrs. R. Almond, of Toronto, were awarded the contract for the erection of new Town Hall here, $13,175. Building is to be completed by January 1st, 1911.

Edmonton, Alta.

J. A. Lockerby has the plumbing, heating and ventilation contract for the new Seventeenth Street School, $16,000.

Davidson, Sask.

K. J. Roseborough, this place, was awarded the contract for the erection of solid brick town hall, $13,700. Other tenderers, E. S. Estlin, Winnipeg, 14,757.55; V. Desautel, Davidson, $15,250; G. N. Hughes, Saskatoon, $14,289; E. J. Rud & Company, Saskatoon, $18,459.95.

Flesherton, Ont.

Mr. David Stevid, of Chesley, has been awarded the contract for the new high school building here. Total cost, including heating plant, is estimated at about $13,000.

Kildonan, Man.

The ratepayers of East Kildonan authorized the erection of new school buildings. Estimated cost, $11,000. Peter McCalman has the contract. Two more wings will be built next year.

Montreal, Que.

Further contracts have been awarded in connection with the erection of the additional wing to McGill University as follows: Plumbing, heating and ventilating, James Ballantyne; carpentry work, Geo. Roberts. Messrs. Brown & Vallance, architects.

Contracts have been awarded as follows for the erection of the Kensington School at Notre Dame de Grace for the Protestant School Commissioners: Excavation, brick work and masonry, Robert Bros., Westmount; carpentry work, Laird, Paton & Son, Limited; painting and glazing, J. A. Alexander; roofing, Metal Shingle & Siding Company, Limited; lathing and plastering, Gray & Wighton; plumbing, hot water heating and ventilating, Geo. R. Woodward & Company.

The contract for the construction of the public bath in St. Henry Ward has been awarded to Mr. Langevin, general contractor. Alphonse Piche, architect.

Orillia, Ont.

The contract for the new Roman Catholic Church has been let to Mr. John Bogue, of Peterboro, at $50,500. The building will will be of Longford stone.

Ottawa, Ont.

N. H. H. Lett, secretary Board of Control, sends us the list of tenders for city hall alterations, which supplements that of last issue:—Masonry, T. C. James, Ottawa, $7,350. Carpentry, Alex. Christie, Ottawa, $9,604; T. A. Shore, Ottawa, $11,500. Plastering, John J. Green, Ottawa, $4.400; J. Sutherland & Son, Ottawa, $5,143; Jas. McLaughlin, Ottawa, $5,996. Heating, Currie & Livock, Ottawa, $5,920. Electric wiring, P. E. Marchand & Company, Ottawa, $1,090; McCallum & Company, Ottawa, $1,507.85. Galvanized iron, McFarlane & Douglas, Ottawa, $1,087; McKinley & Northwood, Ottawa, $650. Ornamental iron, Dennis Wire & Iron Company, London, $5,777.27 (accepted); Modern Machine Company, Ottawa, $7,850; Canada Foundry Company, Ottawa, $7,400. Vault Door, J. & J. Taylor Safe Works, Toronto, $280. Vault doors and elevator not yet decided.

The Board recommended the awarding of the following tenders:—Hopewell Avenue School—Masonry, brickwork and concrete, A. Garvock, $25,000; carpentering, J. and C. Low, $8,548; plastering, A. Bowman & Sons, $1,150; painting and glazing, W. J. Carson, $1,570; roofing, John Tweedie, [illegible]; electrical work, [illegible] & Donnelly, $1,189; heating, Currie & Livock, steel boiler, Webster system, $4,175; plumbing, J. R. McLennan, [illegible] $3,458; ventilation, Sheldons, Limited, Multivane Fan, $1,[illegible]; galvanized iron work, Modern Machine Company, steel closet partitions, Joseph R. Smith, [illegible]; terrano flooring, Terrano Flooring Company of Canada, Limited, $931.75; total, $48,548.75. Breeze Hill Avenue School –

Masonry, brickwork and concrete, A. Garvock, $25,500; carpentering, J. and C. Low, $8,373; plastering, A. Bowman & Son, $1,[illegible]; painting and glazing, W. J. Carson, $1,[illegible]; roofing, John Tweedie, $240; electrical work, Marchand & Donnelly, $1,163; heating, Castle & [illegible], steel boiler, Johnston system, $4,415; plumbing, J. R. McLennan, Mott's closet, $3,423; ventilation, Canadian Buffalo Forge Company, standard fan, 5 h.p., $992; galvanized iron work, Modern Machine Company, $700; glass partitions, Joseph R. Smith, $282; Terrano flooring, Terrano flooring Company, of Canada, Limited, $915; total, $48,523.

St. Timothee, Que.

The contract for the furniture, Roman Catholic Church, has been awarded to Paul Demers. J. O. Turgeon, architect, 55 St. Francis Xavier street, Montreal.

Toronto, Ont.

The Sanitary Floor Company of Toronto have been awarded the contract for laying their marble flooring and wainscoting in the new picture theatre, 324 Yonge street.

Mr. W. W. Peay, 130 Lisgar street, has been given the contract by the Board of Control to tear down and remove exhibition buildings, including Webb dining hall, the women's building, and the poultry building at $705.

The contract for the construction of a new poultry building on the Exhibition grounds has been awarded to C. Hitch & Company, 100 Queen street west, at $36,027.

Vancouver, B.C.

Contracts for the new school offices were awarded as follows: General contract, Ferro Construction Company, $36,640; heating, S. A. Wye, $1,830; painting, W. Wood, $685; total, with excavation ($807.50), $39,992.50.

Residences

Brantford, Ont.

A building permit has been issued to Mr. W. A. Clark for a brick dwelling, cost $2200; Mr. H. Hall, for a brick dwelling, $2,000.

Brandon, Man.

Building permits have been granted to Flavelle and Hills for the erection of four frame residences on Sixteenth street, $10,800; Cecil M. Twiss was also granted a permit for the erection of a brick veneer residence, $4,000.

Edmonton, Alta.

J. C. Calhoun has a permit for residence, $7,000.

Hamilton, Ont.

Permits have been issued to W. T. Pringle, two frame dwellings, Lottridge street and Case street, for S. Chappel, $2,000; Murray & Connor, brick dwelling, Holton avenue, for T. A. Hunt, to cost $2,400; I. G. Thomson, brick dwelling, Ravenscliffe avenue, to cost $5,000; E. R. Paterson, brick dwelling, Hess street, for T. Ramsay, to cost $2,500.

Montreal, Que.

Plans have been prepared for a residence in Terrebonne, Que., for A. D. Pilton, and tenders will shortly be received for same. J. O. Turgeon, architect, 55 St. Francis Xaxier street, Montreal.

Mr. Eugene Payette, is preparing plans for the alterations to a house on Colonial avenue.

Tenders will be received until May 14th for the construction of a residence on Westmount boulevard for Mr. J. A. Cameron. Messrs. Saxe & Archibald, architects.

Tenders for the construction of Mr. J. M. Wilson's residence have been received but no awards have as yet been made. Messrs. Saxe & Archibald, architects.

Tenders for the erection of a residence on McGregor street for Mr. Hr P. Walker will be received until May 13th. J. B. Resther & Sons, architects.

Plans have been prepared for additions to the Prince Apartment House and for the construction of the Magic Apartment House, corner Guy and St. Luke streets, for Mr. J. S. Prince, who is superintending the construction. Mr. Wm. E. Doran, architect.

New Westminster, B.C.

Plans have been adopted for the new parsonage for the congregation of Queen's Avenue Methodist Church. Estimated cost, $6,000.

Ottawa, Ont.

Mayor Hopewell has taken out a building permit for a garage to be located on Queen street. It will be of concrete, fireproof construction, and will cost $12,000.

Outremont, Que.

Mr. J. O. Turgeon, architect, 55 St. Francois Xavier street, Montreal, is preparing plans for two semi-detached residences to be erected for Mr. L. P. Deslonchamps.

Sydney, N.S.

Contractor F. L. Dixon has begun the construction of a dwelling for F. B. Townsend. Cost, $2,500.

Permits have been issued recently as follows: T. Chappell Bros. & Company, Limited, for George McLeod, to cost $3,000; R. C. Bulley, for the erection of a dwelling on George street, $2,200.

Winnipeg, Man.

Tenders addressed to E. D. Tuttle, architect, will be received until May 13th for residence on Wolesley avenue.

A permit has been issued for apartment house, 140 feet frontage, 124 depth, $400,000. Architects, Holman & Prain.

AWARDED.

Brantford, Ont.

J. Bartle has the contract for the erection of residence for Mr. H. Cockshutt.

Montreal, Que.

Tenders have been awarded as follows for the erection of a residence on Sherbrooke street for Mr. Prefontaine: Excavation and masonry, O. Lemay; brick work S. Rochon; wood work, A. Mercure; plumbing, P. Latourelle. Messrs. J. B. Resther & Sons, architects.

Nanaimo, B.C.

C. R. Hardy, of Parksville, has the contract for the erection of houses required for the Salvation Army settlers in French Creek near here.

Outremont, Que.

Mr. J. O. Turgeon, architect, 55 St. Francois Xavier street, Montreal, has awarded the following contracts in connection with the erection of six cottages for Mr. Alex. Saurette. Masonry and brick work, O. Archambault. Tenders for other trades will be called later.

Business Buildings and Industrial Plants

Arnprior, Ont.

The creamery was damaged to the extent of about $2,500. Owner, Mr. A. Russell.

Brandon, Man.

Tenders close on the 11th inst. for construction of freight shed here for the C. P. R. F. Lee, division engineer.

Brandon, Man.

The C. N. R, it is stated, intend to erect a store house at an estimated cost of $20,000.

Bella Coola, B.C.

It is stated that another saw mill will be erected here.

Brantford, Ont.

Tenders will be called at once for the erection of factory for the Crown Electrical Manufacturing Company. Mr. Mosely, secretary-treasurer.

Calgary, Alta.

A project is under way to float a company to undertake the erection of a first-class hotel to cost about $1,000,000.

T. Revillion, of Edmonton, has purchased the corner of First street west and Seventh avenue, where he will build a seven storey office building. Revillion Freres, of Edmonton, Paris and London, also bought 100 feet on Eighth avenue west for a large departmental store.

Campbellford, Ont.

The building owned by W. Hubble was destroyed by fire on the 3rd inst. Total estimated loss, $2,500.

Canora, Sask.

Tenders addressed to J. H. Bossons, architect, will be received until May 16th for the erection of a solid brick hotel for N. Cohen. Plans, etc., at office of the architect, Dauphin Man.

Edmonton, Alta.

J. H. Rudy has prepared plans for a warehouse for O'Farrell & Kelly.

Halifax, N.S.

James Hillis & Sons' foundry was damaged to the extent of about $20,000 on the 3rd inst.

Elmira, Ont.

Work on the new factory for the Dominion Felts, Limited, will, it is stated, begin at once.

Gananoque, Ont.

D. F. Jones manufacturing Company are planning to make additions to their plant.

Hamilton, Ont.

A building permit has been issued to W. H. Cooper for brick additions to International Harvester Company, $14,000; also to Wm. Cross, two 2 storey store buildings, King street, $3,500.

Kinnear's Mill, Que.

Frizzell Brothers' store and buildings owned by R. Garry were destroyed by fire on the 3rd inst. Loss, $10,000.

London, Ont.

The Bolt Works plant will, it is stated, be enlarged under the new management of T. S. Hobbs.

Montreal, Que.

It is stated that plans have been completed for the erection of the new C. P. R. station at Mile End, for which a large amount has been voted by the executive.

It is stated that the Workman property on St. Catherine street, between St. Alexander and Bleury street, has been leased to a syndicate of Montrealers, who will erect a modern restaurant building and bachelor apartments. Mr. F. Truasch, of the Lipton Cafe, St. James street, is interested.

A new milling company has been organized with capital of $2,000,000. The company intend to erect a flour mill with a daily capacity of 2,500 barrels, to cost $300,000 on the Lachine Canal bank near

Atwater avenue. Mr. G. A. Grier and Lieut-Col. Labelle are the interested parties.

The Maloney Mono-rail System Company has been organized with a capital of $200,000, and it is stated that shops will be erected at Montreal, Levis, Toronto, Ottawa and Medicine Hat.

Tenders have been received and tenders will shortly be awarded for the construction of buildings at King Edward Park, Isle Gros Bois. Theo. Daoust, architect, 90 St. James street.

Messrs. T. Pringle & Son, Limited, are preparing new plans and specifications for the Holland Varnish Company's proposed plant.

No awards have been made in connection with construction of the Wabasso Cotton Company's new plant, the proprietors having not definitely decided to proceed with the work. Messrs. T. Pringle & Son. Limited, architects.

Mr. Alphonse Content, architect, is preparing plans for an extensive hotel building to be erected on St. James street to replace a large existing structure. No definite announcement could be made at present, but we understand this is to be a large and modern hotel building.

Tenders will be received until Monday, May 16th, for the construction of four modern store buildings, St. Andre and St. Catherine streets, for Mr. C. Ruddy. Mr. W. E. Doran, architect.

Invited tenders are being received for the construction of two stores on Rachel street for Mr. L. N. Dupuis. J. B. Resther & Sons, architects.

Messrs. Lande Bros., 234 St. Lawrence boulevard, have purchased property with frontage of 62 feet on St. Lawrence and 62 feet on St. Dominique with depth of 151 feet. It is reported that they will erect a 5 storey warehouse and office.

Invited tenders are being received for the carpentry work, plumbing, painting and plastering for the erection of a business block containing two stores and two dwellings, Amherst and Beaubien street, for J. L. Legault. Messrs. J. B. Resther & Sons, architects.

Tenders for the construction of the Yorkshire Insurance Building have been received but no contracts have been awarded to date. Messrs. Saxe & Archibald, architects.

Morrisburg, Ont.

The Morrisburg Tack Manufacturing Company after the erection of the tack factory will erect one for the manufacture of nails.

Norwood, Ont.

The following are some of the losers in the fire here: E. J. King, proprietor King's Hotel; B. W. Leverett, W. A. Richardson, J. E. Thompson, K. G. Thomson. Estimated total loss, $100,000.

Ottawa, Ont.

W. E. Noffke, architect, is preparing plans for an 8 storey office building on Sparks street, to be erected for James Hope & Sons. It is stated that the building will be started this summer.

Port Hope, Ont.

The block owned by R. Devell was destroyed by fire on the 3rd inst. Total estimated loss, $23,000

Prince Rupert, B.C.

Sol. Cameron is to build a five storey hotel of steel and concrete. A refrigerating plant is to be established at Seal Cove, Prince Rupert.

Port Moody, B.C.

The Emerson Lumber Company have sold their property, the terms of sale giving use of property for three years. It is reported that they intend erecting on another site a large mill.

Peterborough, Ont.

W. H. Denham has a permit for the new elevator to be erected for the Quaker Oats Company $90,000.

Rossland, B.C.

The saw mill, planing mill, etc., owned by J. S. Deschamps, were destroyed by fire on the 28th ult. Estimated total loss, $35,000.

Strathroy, Ont.

The 3 storey Dominion block was destroyed by fire on the 5th inst. T. Statham & Son are the heaviest losers.

Summerland, B.C.

The blacksmith and woodwork shops of Messrs. Shields & Hatfield here were destroyed by fire recently. Loss, upward of $4,000.

Toronto, Ont.

Mr. David Elliott, of the Elliott Manufacturing Company, will establish a paper mill in Ashbridge's marsh.

Vancouver, B.C.

The plans of the A. B. C. Elevator & Wharf Company, it is stated, include the erection of large grain elevators at New Westminster, Prince Rupert and this city, and also cold storage plant and wharves here or in New Westminster.

Victoria B.C.

Building permits have been issued to Messrs. Lee Chong & Company for a brick building on Broad street for offices, to cost $4,000.

It is stated that Mr. Alvo Von Alvensleber, German Consul, will erect at Sooke a large hotel on the Jackson-Bostock property.

Windsor, Ont.

The ratepayers approved of the expenditure of $20,000 in inducing industries to locate here.

Winnipeg, Man.

E. L. Drewry is preparing for the erection of a large 60 x 150 modern stable in connection with the Redwood mannufacturing plant. Cost, about $30,000. H. Matthews, architect.

Mr. Barber is the Canadian manager for the B. F. Nelson Company, Minneapolis, which is considering the establishment of a branch warehouse here.

Blackwood Brothers' brewery and warehouse, on Colony street, was almost completely destroyed by fire on the 2nd inst. Estimated total loss, $100,000.

J. J. Vopni, contractor, has the contract for the erection of 3 story stone building, corner of William avenue and Nena street, for the Logberg Icelandic Newspaper Company.

W. W. Blair is the architect for the 7 storey factory to be erected for the Great West Saddlery Company. Noted previously.

Tenders addressed to Jordan & Over, architects, Canada Life Building, will be received until May 14th for all trades required in the erection of a brick building for the Union Bank of Canada.

AWARDED.

Edmonton, Alta.

Contracts for the Dominion Bank and the National Trust blocks were awarded last week to Claydon Bros., of Winnipeg.

Fort William, Ont.

M. H. Braden, of this city, has been awarded the contract for the new C. P. R. shops here.

Montreal, Que.

The contract for the steel work, Rossenburg Building, extending from St. Lawrence to St. Charles Borromee street, has been awarded to the Dominion Bridge Company, Limited. Mr. Eugene Payette, architect.

The Structural Steel Company, Limited, have been awarded contracts for structural steel work and erection, Alexander street school, for the Protestant School Commissioners, and also for the new warehouses of the Anglo-Canadian Leather Company.

The contract for excavation in connection with the additions to the Place Viger station has been awarded to John Stewart & Company, general contractors. W. S. Painter, C. P. R. architect.

The general contract for alterations to the building of Messrs. Dyment & Duffield adjoining the Orpheum Theatre on St. Catherine street has been awarded to Mr. C. E. Deakin. Messrs. Finley & Spence, architects.

Mr. C. E. Deakin has been awarded the general contract for alterations to the property at 403 St. Catherine street west for Messrs. Dunlap, Cooke & Company, furriers. Mesrs. Munroe & Lead, architects, Hamilton, Ont.

The general contract for the erection of a three storey fireproof store building, northeast corner of St. Catherine and Visitation streets, for Mr. N. Ethier, has been awarded to Carriere Freres, general contractors. L. R. Montbriant, architect.

Moose Jaw, Sask.

The contract for the large extensions to the C. P. R. freight sheds at this point has been awarded to the Carter, Halls, Aldinger Company.

Sydney, N.S.

The Dominion Iron & Steel Company, Limited, recently placed the contract for a new mill with the Morgan Construction Company, of Worcester, Mass.

Vancouver, B.C.

Mr. Jonathan Rogers will erect the addition to the Royal Bank, southeast corner Hastings street and Westminster avenue.

Power Plants, Electricity and Telephones

Ingersoll, Ont.

A by-law was carried to buy the electric light plant for $39,800.

Merritt, B.C.

At a meeting of the Merritt Electric Light & Water Company it was decided to install a modern electric lighting system costing over $15,000.

New Westminster, B.C.

B. C. E. R. Company is planning the construction of another new line. The new road will, it is understood, be built from a point on the Chilliwack division some twenty-five or thirty miles from this city.

Neepawa, Man.

On May 18th a by-law will be submitted to ratify agreement between the government for the transfer and sale of the telephone plant to the government.

Port Arthur, Ont.

Tenders addressed to Hon. Adam Beck, chairman, Hydro-Electric Power Commission, will be received until May 25th for construction of transformer [illegible]

(Continued on page 30)

Tenders and For Sale Department

Tenders for

Concrete Bridge and Floor

Tenders will be received up to the hour of [illegible] on TUESDAY, MAY 10TH [illegible] Concrete Arch, near New [illegible] Concrete Floor on Bridge, near [illegible] prepared by Bowman and Connor [illegible]. For further information apply to F. Vickert, Esq., Princeton, or to

HERBERT J. BOWMAN, C.E.,
19 County Clerk, Berlin

City of Vancouver

Tenders for

Garbage Destructor Plant

Tenders will be received by the undersigned up to 3.00 p.m., TUESDAY, THE 31ST OF MAY, 1910, for the installation of a Garbage Destructor Plant at the Bridge street yard, on the south side of False Creek in the City of Vancouver, British Columbia. The plant must be capable of destroying not less than seventy tons of mixed garbage per day of twenty-four hours.

Tenderers will be required to submit plans and specifications with their proposals and furnish a satisfactory bond and guarantee that the destructor will fulfill all the provisions of the specifications.

The tendered price is to include the erection of the stack and all necessary buildings.

A deposit of an amount equal to 5 per cent. of the contract price must be made with each tender by marked cheque payable to the City Treasurer.

The lowest or any tenders not necessarily accepted.

W. McQUEEN,
19 City Clerk.

City of Winnipeg

Tenders for

Construction of Brown and Brant Street Overhead Bridge

Sealed tenders, addressed to the Chairman, Board of Control, Winnipeg, and marked on the envelope, "Tenders for Brown and Brant Street Bridge," will be received at the offic of the undersigned up to 11 o'clock a.m., on TUESDAY, JUNE 28TH, 1910, for the following works:—

(a) Construction of Concrete Piers, to be completed on or before the fifteenth day of November, 1910.

(b) Erection of Steel Superstructure and floors, with two lines of street railway tracks, to be completed on or before the first day of June, 1911.

Plans, specifications and forms of tender, together with conditions governing tenders as prescribed by by-law, may be obtained at the office of the City Engineer, Winnipeg. The lowest or any tender not necessarily accepted.

M. PETERSON,
Secretary.

Office of the Board of Control,
Winnipeg, April 30th, 1910. 19

Notice to Contractors

Sealed tenders addressed to the undersigned will be received up to 3 o'clock p.m. on THURSDAY, THE 26TH DAY OF MAY, 1910, for the construction of Concrete Abutments, containing approximately 80 cubic yards, for a steel bridge in the Township of Onondaga, in the County of Brant. The site of the bridge is about two miles from Onondaga Station, G. T. R., and the same distance from the Village of Middleport,

Tenders must contain the composition of the concrete.

Contract will be awarded then if satisfactory.

S. J. McKELVEY,
Township Clerk,
19 Tuscarora P.O,, Ont.
19

Notice to Contractors

Sealed tenders, marked, will be received by the Town Clerk up to 5 o'clock p.m. on WEDNESDAY, 18TH MAY, 1910, for the building of a brick Town Hall.

Plans and specifications may be seen at the Clerk's office.

Tenders may be for the whole works or for parts thereof.

A certified cheque to the amount of five per cent. thereof, payable to the order of the Town Treasurer, must accompany each tender.

Lowest or any tender not necessarily accepted.

J. C. ECKFORD,
Town Clerk.
19 Southampton, Ont.

Town of Fort Frances

Sealed tenders will be received by the Corporation of the Town of Fort Frances, addressed to W. H. Elliott, Clerk of Fort Frances, Ont., until 8 o'clock p.m., on THURSDAY, THE 26TH DAY OF MAY, 1910, for the construction and completion of the following contracts in the extension of the sewerage system of the said Town of Fort Frances, viz.:

"A." All labor for the construction of the extension to the sewerage system, and certain materials therefor.

"B." The supplying of vitrified tile pipe and junctions.

"C," The supplying of cast iron manhole covers, catch basin covers, and flap valves.

Copies of plans and specifications and forms of tender may be had upon application to the undersigned, the Clerk of Fort Frances.

H. WILLIAMS, Mayor. W. H. ELLIOTT, Town Clerk.
Fort Frances, April 21st, 1910. 19

Town of Virden

Supply of Cement

Tenders addressed to the undersigned will be received up to 12 o'clock noon, on MONDAY, THE 23RD DAY OF MAY, for the supply of 800 barrels (more or less) of cement, to be used in the construction of cement sidewalks.

Tenders to state price for same f. o. b. cars, Virden.

A marked cheque or cash deposit equal to 5 per cent. of price for same must accompany each tender.

The lowest or any tender not necessarily accepted.

J. F. C. MENLOVE,
Secretary-Treasurer.

Dated at Virden, Man., this fourth day of May, A.D. 1910.
19

Tenders

will be received at the office of the undersigned up to 12 o'clock noon, SATURDAY, MAY 14TH, 1910, for tearing down and removing buildings on property southeast corner of Gerrard and Parliament streets. Specifications may be seen at office.

JAMES L. HAVILL, Architect,
108 Mail Building,
19 King and Bay street, Toronto.

TO CONTRACTORS

Separate and lump tenders will be received until MAY 14TH for the necessary trades in connection with the erection of a Brick School House in School Section No. 12, Homer Avenue, Mimico, Ont.

Plans and specifications can be seen and all necessary information obtained at my offices, 164 Bay street.

19 E, J. LENNOX, Architect.

Town of Orillia

Sewerage Works

Tenders will be received by the Town Clerk until 8 p.m. on MONDAY, MAY 16TH, 1910, for Sewage Sedimentation Tanks.

Plans and specifications may be seen at the Town Hall, Orillia, or at the office of the Chief Engineers, 204 Mail Building, Toronto.

No tender necessarily accepted.

W. C. GOFATT, ESQ., Mayor, Orillia, Ont.
C. E. GRANT, ESQ., Town Clerk, Orillia, Ont.

CHIPMAN AND POWER, Chief Engineers,
19 Toronto, Ont.

Board of Education

Toronto

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board will be received until

Friday Noon, May 13th 1910

for the several trades required in the

Erection of Oakwood High School, St. Clair Avenue,

Alterations to Joseph Workman School, Coolmine Road,

Alterations to St. Clair Avenue School.

Plans and specifications may be seen and all information obtained at the office of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in said specifications and forms of tender. The lowest or any tender will not necessarily be accepted.

W. H. SMITH, Chairman of Committee,
W. C. WILKINSON, Sec.-Treas.
19

Bridge Tenders

Sealed tenders will be received by Wm. Purves, Township Clerk, Columbus, Ont., up to noon, on SATURDAY, MAY 28TH, for the construction of Two Reinforced Concrete Bridge of 32 feet and 22 feet spans, near Oshawa.

Plans and specifications may be seen and information obtained from the Clerk, or from Hiram Gifford, Reeve of East Whitby, Cedardale, or from the engineers.

BOWMAN AND CONNOR,
36 Toronto street, Toronto.
20

COMPETITIVE PLANS

Competitive working sketches will be received by the undersigned up to and including MAY 28TH NEXT, for a four-roomed brick public school building with modern conveniences.

It is desired that the building be so planned that additional accommodation may be conveniently added to it when circumstances demand. Address

THOS. I. TRUEMAN,
Secy.-Treas. Public School Board,
Midland, Ontario.
20

Macadamizing Tenders

will be received at the office of the undersigned, Alexandria, until 6.30 p.m. on MONDAY, MAY 16TH, instant, for the macadamizing of a part of Main street, Alexandria, extending about 1375 lineal feet, and containing about 4,745 square yards, according to plans and specifications to be seen at the office of the undersigned. Tenderers are requested to state whether their tenders include, or do not include, their supplying the necessary road machinery and equipment.

E. H. TIFFANY,
Town Clerk.
Alexandria, May 3, 1910. 19

Town of Outremont

Tenders for Sewers

Tenders will be received by the undersigned up to WEDNESDAY, NOON, THE 18TH DAY OF MAY, 1910, for the construction of a 3 x 4½ foot trunk sewer on Pacific avenue, Durocher street, Van Horne avenue to Outremont avenue, about 3,200 feet; a 3 x 2 sewer on de l'Epee street, from Laurier avenue to St. Viateur street, about 1,800 feet; a 3 x 2 sewer on Maplewood avenue, about 800 feet.

Plans and specifications may be seen at the Town Hall.

A deposit of 10 per cent. is required.

J. KRUSE,
Secretary-Treasurer.
Outremont, 5 May, 1910. 19

Town of Wingham

To Well Contractors

Tenders will be received by the undersigned up to 19TH MAY, 1910, for the supply of material and sinking of two artesian wells [illegible] inches in diameter.

Specifications may be seen at the office of the secretary in Wingham, or at the office of the engineers, Davis and Johnston, Berlin, Ont.

Contractors must satisfy the Commission of their experience and ability to execute [illegible] fully the work contemplated.

The lowest tender not necessarily accepted.

I. A. MORTON, Secretary,
Board of Water Commissioners, Wingham, Ont.
19

Town of Virden

Concrete Sidewalks

Tenders addressed to the undersigned will be received up to 12 o'clock noon, on MONDAY, THE 23RD DAY OF MAY, for the construction of 15,000 lineal feet (more or less) of cement sidewalk, four, five and six feet in width.

Specifications and other information may be obtained at the office of the undersigned.

A marked cheque or cash deposit equal to 5 per cent. of cost price for same must accompany each tender.

The lowest or any tender not necessarily accepted.

J. F. C. MENLOVE,
Secretary-Treasurer.

Dated at Virden, Man., this fourth day of May, A.D. 1910. 19

Hydro-Electric Power Commission of Ontario

Tenders for Transformer Station, Port Arthur, Ontario

Tenders will be received up to 9 a.m. WEDNESDAY, MAY 25TH, 1910, for the construction of Transformer Station Building, Superstructure, Port Arthur, Ont., all according to plans and specifications to be obtained at the offices of the Commission, Continental Life Building, Toronto, or at the City Engineer's office, Port Arthur. Separate tenders for structural steel work will receive consideration.

Plans and specifications may be obtained upon a deposit of $5, which deposit will be promptly refunded upon receipt of tender, or the return of plans and specifications.

Certified cheques to the amounts called for in the "Instructions to Bidders" must accompany each tender.

The lowest or any tender not necessarily accepted.

Tenders must be sealed and addressed to Hon. Adam Beck, Chairman Hydro-Electric Power Commission, Continental Life Building, Toronto, Ontario.

(Papers inserting this advertisement without authority will not be paid for same.) 19

Perth Avenue Fire Hall

Bulk tenders, or separate tenders, for the several works mentioned below, in connection with the above building, will be received by registered post only, addressed to the undersigned, up to noon on TUESDAY, 17TH MAY, 1910.

1. Concrete Paving, etc.
2. Hardware.
3. Sliding Poles.
4. Covers for Sliding Pole Openings
5. Metal Weather Strips.
6. Stable Fittings.

Plans and specifications may be seen and forms of tender and all information obtained at the office of the City Architect, City Hall, Toronto.

Envelopes containing tenders must be plainly marked on the outside as to contents.

The usual conditions relating to tendering as prescribed by city by-law must be strictly complied with or tender may not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman Board of Control.
City Hall, Toronto, 5th May, 1910. 19

Tenders for Paving

The City of Saint John Invites Tenders for

Paving, etc., in Main, Pond, Smythe, Nelson and St. John streets, according to plans and specifications to be seen and forms of tender obtained at the office of the City Engineer, Room No. 5, City Hall, duplicates of which are on file in the office of the "Contract Record," 504 Confederation Life Building, Toronto.

A cash deposit must accompany each bid, the amount being as stated in each specification.

The city does not bind itself to accept the lowest or any tender.

All tenders must be addressed to the Common Clerk, Room No. 3, City Hall, who will receive bids until noon of TUESDAY, THE 31ST DAY OF MAY, A.D. 1910.

ADAM MACINTYRE, Comptroller.
WM. MURDOCH, City Engineer.
St. John, N.B., May 7th, 1910. 21

City of Prince Albert

Tenders

Sealed tenders addressed to the undersigned and marked "Tenders for Extensions" will be received until noon on SATURDAY, THE 14TH DAY OF MAY, 1910, for the construction of extensions to the water and sewerage systems of the City of Prince Albert, comprising approximately the following work:—

4,585	Lineal Feet 10-inch Water Main.
984	Lineal Feet 8-inch Water Main.
3,395	Lineal Feet 6-inch Water Main.
6½	Tons Special Castings.
19	Valves.
13	Hydrants.
535	Lineal Feet 24-inch Storm Sewer.
667	Lineal Feet 18-inch Storm Sewer.
580	Lineal Feet 8-inch Storm Sewer.
3,056	Lineal Feet 8-inch Sanitary Sewer.
13	Man Holes.
1	Flush Tank.
1	Lamp Hole.
16	Catch Basins.

Plans and specifications may be seen and forms of tender obtained at the office of the City Engineer of the City of Prince Albert after May 2nd, 1910.

C. O. DAVIDSON,
City Clerk.
Dated at Prince Albert, April 27th, 1910. 19

Positions Vacant

Advertisements under this heading [illegible]

WANTED—TRAVELLING SALESMAN to represent firm manufacturing bank, office and store fittings. Must be competent to make sketches, etc. Man having experience in architect's office preferred. Apply, Box 974 "Contract Record," Toronto. 19

Positions Wanted

Advertisements under this heading [illegible]

WANTED POSITION AS SUPERINTENDENT, to take charge of concrete or railway construction work. I am thoroughly experienced in this line of work. Address, Box 978, "Contract Record," Toronto, Ont.

Miscellaneous

[illegible]

AGENTS WANTED—[illegible] wish to get in touch with [illegible] firm or individual to represent them in Canada. This would be a desirable opportunity for an energetic young architect or engineer. Box 970 "Contract Record."

Town of Virden

Overseer

Applications will be received by the undersigned up to 12 o'clock noon on MONDAY, MAY [illegible] for the position of Overseer for the construction of cement sidewalks during the season of 1910.

Applicants must state past experience and salary expected, and enclose references.

J. F. C. MENLOVE,
Secretary-Treasurer

Dated at Virden, Man., this fourth day of May, A.D. 1910. 19

Town of Prescott

Sewer Construction

Sealed tenders will be received by the undersigned up to noon of SATURDAY, MAY THE 21st, 1910, for the construction of "Sewers, Septic Tank and Outlet" in connection with the sewerage system of the Town of Prescott.

Plans and specifications may be seen and forms of tender obtained at the office of the Town Clerk, Prescott, or at the office of Morris and Moore, Pembroke, after Monday, the 9th day of May, 1910.

Tenders must be made on forms supplied, signed and sealed, and marked on outside "Tender for Prescott Sewer," accompanied by an accepted cheque for one thousand dollars on a chartered bank of Canada, made payable to the Town Treasurer of the Town of Prescott.

F. W. ELLIOTT,
Chairman Sewerage Committee,
Prescott, Ont.

20

Temiskaming and Northern Ontario Railway Commission

Sealed tenders addressed to the undersigned and endorsed on envelope "Tender for Steel Tank," will be received up to NOON ON TUESDAY, MAY 17TH, 1910, for all Labor, Tools, Equipment and Material for the manufacture and erection, including all fixtures above the foundation, of a fifty thousand imperial gallon steel tank at North Bay Junction, Ont.

Specifications may be seen at the office of Chief Engineer, North Bay, or the Secretary Treasurer, 25 Toronto street, Toronto.

Lowest or any tender not necessarily accepted.

A. J. McGEE,
Secretary-Treasurer, 25 Toronto St.,
Toronto, Ont.

Toronto, May 10th, 1910.

P.S.—Papers inserting this advertisement without authority it will not be paid for it. 19

John M. Walkley & Company, electricians, Montreal, Que., have dissolved.

Alex. Cushing & Company, lumber merchants, St. John, N.B., have assigned.

W. C. Martin & Company, hardware merchants, Rossland, B.C., are closing out.

James Wilson & Company, painters, Hamilton, Ont., have dissolved, C. Wilson continuing.

Power Plants, Electricity and Telephones

(Continued from page 27)

ing, superstructure. Plans, etc., at offices of the Commission, Continental Life Building, Toronto. See advertisement in this issue.

Regina, Sask.

The by-law to grant street railway franchise to J. W. DeC. O'Grady, of Winnipeg, was defeated.

Wellington, B.C.

B. C. E. R. is contemplating the construction of an aerial tramway to connect its Lone Star mines with its Wellington property. The proposed tramway will be about seven miles in length. Newman Erb is president of the company.

AWARDED.

Fort William, Ont.

Stewart & Hewitson were awarded a contract for rock and screenings at $1.35 a cubic yard, by the Fort William Street Railway Company.

Toronto, Ont.

The American Sewer Pipe Company were given the contract for supplying conduit required by the city in connection with the hydro-electric system at the following prices per duct foot: Butt joint, round bore, .0590 cents; square bore, .0635 cents.

Welland, Ont.

David Dick & Sons, Limited, have the contract for the building 150 miles of Hydro-Electric line from St. Thomas to Berlin, and Ingersoll to London.

Miscellaneous

Hanover, Ont.

On June 22nd the county council of the county of Tay will consider a by-law to raise $20,000 4 1-2 per cent. local improvement debentures. John Rutherford, county clerk.

Halifax, N.S.

The following tenders for supply of lumber for 1910-1911 were received: Rhodes, Curry & Company, $1,370.96; J. McInnes & Sons, $1,361.43; Brookfield Bros., $1,342.17. The latter was recommended by the Board for acceptance.

Leamington, Ont.

Tenders addressed to A. Baird, C.E., will be received until May 28th for improvement of Big Marsh drainage system, Pelee Island. Plans, etc., at office of above mentioned.

Montreal, Que.

Recent building permits include: T. J. Bissillon, 446 Sherbrooke west, two houses containing nine dwellings, $20,000; F. Gauthier, 572 Marie Anne east, two houses containing two dwellings and two stores, $6,800; F. Therrien, 373 Dorion, two houses containing eight dwellings, $6,000; H. Labelle & Company, Notre Dame street west, one house, one store and one warehouse, $10,500; Jos. Lanctot, 330 Mt. Royal, one house containing three dwellings, $10,000; St. Nicolas Syndicate, Syrian Orthodox Church, $8,300; J. A. Vaillancourt, 155 Marquette, two houses containing five dwellings, and one store, $7,500; Bloomfield Bros., 17 Notre Dame west, four houses containing four dwellings and four stores, $8,000; Geo. Hall Coal Company, 112 St. James street, one coal elevator, $9,000; T. Sauve, 1161 Simard street, two houses containing six dwellings and one store, $6,000; School Commissioners St. George, St. Urbain street, one school, cost $35,000; N. Therriens, 74 Villeneuve, two houses containing six dwellings, $7,000; E. G. Rivet, 141 Clarke, one house containing two dwellings, $3,400; M. Dupuis, 65a St. Andre, one house containing three dwellings, $2,500; Jos. Dupuis, 65 Delinelle, one house containing three dwellings, $2,500; E. Dupuis, 107a St. Phillipe street, one house containing three dwellings, $2,500; Felix Libercent, 1084 St. Dominique street, two houses containing six dwellings, $6,000; F. C. Marquis, 505 Laval, one house containing three dwellings, $4,600; Arsene Lamy, 1023 St. Hubert, one house containing three dwellings, $7,000; Arsene Lamy, Limited, Drolet street, house, store and warehouse, $9,000; Jos. Charlebois, 290 Rivard, two houses containing six dwellings, $5,000; Luois Lebeau, 1260 Des Erables, two houses containing six dwellings, $5,000; Guaranteed Pure Milk Company, 875 St. Catherine west, one house containing four dwellings, three stores and one factory, $40,000; M. Simister, 108 Durocher, alterations to two houses, $4,000; J. A. Jarry, 817 St. Joseph Boulevard, alterations to two houses, $6,000.

Ottawa, Ont.

The supplementary estimates for fiscal year ending March 31, 1911, include also St. Peter's Canal, repairs, $25,000.

Regina, Sask.

The by-laws involving an expenditure of $484,500 for public improvements were endorsed by the ratepayers.

Toronto, Ont.

Tenders will be received until May 17th for year's supply of lumber required by the Property Department. G. R. Geary, chairman, Board of Control.

Recent building permits issued were:—Mr. Frank, 2 pairs semi-detached 2 storey brick dwelling, corner Howland and Simpson, $7,000; E. R. Rogers, 2 1-2 storey brick dwelling, 32 Wells Hill avenue, $10,000; J. S. A. Whealey, 5 detached 2 1-2 storey brick dwellings, Bowden, $14,000; C. O. Douglas, 2 storey and attic brick dwelling on Maynard and King, $6,500; W. A. Murray Company, sub-basement, near Victoria on Colborne, $5,000; Amos Schunk, 3 storey brick apartments, on Palmerston and Herrick, $20,000; Alex. Patterson, 2 storey and attic brick dwelling on Parkwood, $9,000; Harton Walker, 2 storey and attic brick dwelling, on Edgar, $6,000; J. C. Boukh, 2 1-2 storey brick dwelling, on Russell Hill road, $7,000; Thos. West, 1 storey brick addition to factory, on Esplanade, $11,000; G. T. Wolfe, 2 storey and attic brick dwelling, High Park boulevard, $5,600; Chas. Henderson, 2 storey and attic brick dwelling, High Park boulevard, $7,000; J. A. Taylor, 1 pair semi-detached 2 storey brick dwellings, Eastern, $4,000; W. S. Grimshaw, 4 attached 3 storey brick stores and dwellings, on College, $14,000; Mrs. J. Denovan, 2 storey and attic brick dwelling, corner Schofield and Highland, $6,800; Board of Education, 3 storey brick school, Kimberley, $35,000; John Hughes, 1 pair semi-detached 2 1-2 storey brick dwelling, Constance, $5,400; G. M. Bryan, 3 detached 2 1-2 storey brick dwellings on Park road, $13,000; Dr. Mason, 2 1-2 storey brick dwelling on Binscarth, $4,000; Stone, Limited, addition to factory on 461 King street west, $35,000; Alex. Morris, 2 storey and attic brick dwelling, Warren road, $8,000; A. & A. Grant, 1 pair semi-detached 2 storey brick dwelling, Lansdowne, $5,000; Dominion Bridge Company, 1 storey brick and steel addition to shop on Sorauren, $5,000; J. T. Turner, 1 pair semi-detached 2 1-2 storey brick dwellings on Dearbourne, $5,000; Jas. Henderson, 3 attached 2 storey brick stores and dwellings on Queen west, $11,000; J. J. Boland, 1 pair semi-detached

2 storey brick dwellings on Symington, $5,000; J. A. Hambleton, 1 pair semi-detached 2 1-2 storey brick dwellings on Crawford, $6,000; Hugh Rose, 2 storey brick dwelling on 121 Concord, $4,500; Swift & Wyatt, 1 pair semi-detached 2 storey brick dwellings on Grandview, $4,000; J. S. Eby, 2 storey brick store and dwelling on Roncesvalles, $4,500; C. Heehn, 1 pair semi-detached 2 storey brick dwellings, Balmoral, $4000; M. J. Doyle & Son, 1 pair semi-detched 2 storey brick dwellings on Royce, $4,000; J. G. Bemrose, 2 detached 2 1-2 storey brick dwellings on Humberside, $5,400; J. L. Bartlam, 2 1-2 storey brick dwelling on Wright avenue, $4,500; Haindle Bros., 3 attached 2 storey brick dwelling on Winnifred, $5,600; J. O'Donnell, 2 storey brick dwelling on south side Dundas, $4,000; Mary Baldwin, 3 detached 2 1-2 storey brick dwellings on Mavety, $6,900; R. C. Vaughan & Son, 2 storey and attic brick dwelling on Russell Hill drive, $7,000; J. R. Gifford, 1 pair semi-detached 2 1-2 storey brick dwellings on Sparkhall, $4,650; A. H. Garrett, 3 attached 3 storey brick stores and dwellings, College and Grace, $12,000; G. Marshall, alterations to 1 pair, 26 Burnfield avenue, $4,000; M. T. Mace, 3 attached 2 storey brick dwellings, Gerrard east, $7,000; Thos. Holmes, 2 pairs semi-detached 2 storey brick dwellings on west side Dundas, $8,000; P. McConvey, 1 pair semi-detached 2 storey and atticbrick dwelling on Manning, $4,400; A. G. Love, 2 storey brick store and dwelling, Dovercourt and Van Horne, $6,500; J. M. Johnston, 2 storey brick tenement house, corner Davenport and McAlpine, $4,000; Mrs. J. H. Haffa, 1 pair semi-detached 2 storey brick dwellings on 171a and 171b Howland avenue, $5,000; Wm. Morgan, 1 pair semi-detached 2 storey brick dwellings on Shaw, $4,500; R. E. McDonagh, 1 pair semi-detached 2 1-2 storey brick dwellings on Havelock, $5,000; Cossaway & Charlebois, 2 detached 2 storey brick dwellings on College, $7,000; Heintzman & Company, alterations to store on 195 Yonge, $30,000; W. Stubbings, 1 pair semi-detached 2 1-2 storey brick dwellings on St. Clarens, $4,500; J. A. Orr, 2 detached 2 storey and attic brick dwellings Sunnyside and Wright, $5,000; Tuero & Monzon, 1 pair demi-detached 2 1-2 storey brick dwellings on Sparkhall, $5,200; Mr. Bollons, 2 detached 2 1-2 storey brick dwellings on Constance, $6,500; G. Knaggs, 2 detached 2 storey and attic brick dwellings on Triller, $8,000; Gold Medal Manufacturing Company, 6 pairs semi-detached 2 storey and attic brick dwellings on Carlaw, $30,000; J. R. Galbraith, 1 pair semi-detached 2 storey brick dwellings, corner Emerson and Armstrong, $5,000; R. S. Tickner, 1 pair semi-detached 2 storey brick dwellings on Dovercourt, $4,000; H. Wright, 2 1-2 storey brick dwelling, corner Marmaduke and Roncesvalles, $4,000; Thos. Morris, 2 detached 2 storey and attic brick dwellings on Willoughby, $5,000; Chas. Jolliffe, 1 pair semi-detached 2 storey and attic brick dwellings on 441-3 Gladstone, $6,000; R. Broundle, 1 pair semi-detached 2 storey brick stores and dwellings on College, $4,300; Geo. A. Griffith, 2 storey and attic brick dwelling an 414 Dovercourt road, $5,000; Robt. Kerr, 1 pair semi-detached 2 storey brick dwellings on Lansdowne, $4,000; G. H. Weale & Sons, 1 pair semi-detached 2 storey brick dwellings on Winnifred, $4,000; J. E. Peterkin, 1 pair semi-detched 2 storey brick dwellings on Garden, $4,000; D. B. Bowerman, 2 storey and attic brick dwelling on 15 Whitney avenue, $9,000; R. Robson, 2 pair semi-detached 2 storey brick dwellings on Walmer, $8,000. J. W. McAlpine, 2 1-2 storey brick dwellings, on south side Hogarth, $4,500; R. C. Bustard, 2 1-2 storey brick dwelling on 43 Dunvegan road, $4,500; Merchants Fire, 3 storey brick office building, near Church, on Adelaide east, $25,000; A. A. Barthelmes Company, 5 storey brick factory on Noble and Strickland, $46,000; T. A. Fleming, 2 pairs semi-detached 2 storey brick dwellings on 297-303 Evelyn avenue, $8,000; R. C. Bustard, 2 1-2 storey brick dwelling on 60 Rowanwood avenue, $4,500; Rev. C. C. Darling, 2 storey and attic brick dwelling on Palmerstone boulevard, $6,000; Caplan Bros., 3 storey brick store and dwelling on 187 McCaul street, $6,000; R. A. Shields, 5 attached 2 storey brick dwellings on Howland, $10,000; H. Rann, 1 pair semi-detached 2 storey brick dwellings on Albermarle, $4,500; Weismiller & MacKenzie Bros., 3 storey brick store and dwelling on Queen street west, $7,500; Graydon & Doner, 1 pair semi-detached 2 storey brick dwellings on 96-98 Lucas street, $4,000; Albert Littler, 2 detached 2 storey and attic brick dwelling on 559-561 Brock avenue, $5,200; D. L. Smith, 2 1-2 storey brick dwelling on Pacific, $4,000.

Vancouver, B.C.

Building permits include: Vernon Bros., 2640 Point Grey road, three houses, $9,000; D. A. McMillan, 2830 Dock street, three houses, $8,000; W. J. Wienmoth, 2277 Third avenue west, two houses, $4,400; A. Shoeman, 2781 Point Grey road, $2,650; School Board office building, Hamilton street, $40,000; Jefferson & Clapham, Victoria drive, two houses, $4,000; M. E. Acteson, 2103 Sixth avenue west, $4,500; St. Saviour's Church rectory, Semlin drive, $3,000; J. Trick, 557 Eleventh avenue east, $3,000; S. J. Steeves, 1285 Thirteenth avenue west, $4,000; Imperial Oil Company, addition to warehouse, $15,000; J. E. Guinet, Parker street, two houses, $4,000; G. R. Lonergan, four frame dwellings, Nanaimo street, $5,600; John Knight, three frame dwellings, Cotton drive, $6,600; Dr. Hall, Davie street, $5,000; Sullivan Company, Seymour street, $3,000; Knudson & Dunlap, 154 Tenth avenue east, $4,085; R. L. R. Maitland, 2030 Haro street, $4,600; S. Henderson, 1106 Pender street, $6,000; W. J. Wenworth, frame dwelling, 2273 Third avenue, $4,400; Mrs. D. Love, frame dwelling, 1330 Victoria drive, $2,000; A. Shoeman, frame dwelling, 2781 Point Grey road, $2,650; Vernon Bros., frame dwelling, 2640 Point Grey road, $9,000; F. Moyer, 4 Thirteenth avenue, $3,000; J. E. Guinet, 1434 Parker street, $2,000; M. E. Blackwell, 1848 Third avenue west, $4,300.

Wingham, Ont.

Tenders are being called by this municipality until May 19th for the sinking of 2 artesian wells, etc. See advertisement in this issue.

Winnipeg, Man.

Recent building permits include: C. S. Tupper, house, Assiniboine avenue, $16,000; A. S. Knight, hotel, Higgins avenue, $46,000, three storey brick and stone, 82 x 71 feet; C. Midwinter, house, Harbison street, $2,500; A. W. Walsh & Company, house, McMillan, $3,000; H. Galbraith, house, Banning street, $2,500; Olafson Grain Company, elevator, southeast corner of Tweed and Roland, $6,000, capacity 30,000 bushels; T. H. Goodman, two houses, Morley, $3,000; W. J. Christie, store, corner Main and James street, $3,500; Regent apartment block, west side Osborne street and Assiniboine river, $130,000; Wallace & Aikins, Buell avenue, $4,800; J. H. Dickie, Chestnut street, $4,700; V. Pat[illegible] southeast corner McMan avenue and John street, $6,000; Mark Fortune, Wellington crescent, $30,000; West End Realty Company, Lipton street, 2 dwellings, $3,600; West End Realty Company, west side Banning street, 2 dwellings, $3,600; Jonasson and Hall, Beverley street, $2,500; F. W Alloway, 407 Assiniboine avenue, fireproof garage, $2,500; J. H. Wye, dwelling, ingsway, $6,000; J. Matthews, 4 dwellings, Morley avenue, $12,000; E. Bremner, dwelling, Telfer street, $8,400; Sparrow Bros., dwellings, Yale avenue, $7,000, 1 dwelling $7,200; Oblate Fathers, printing office, northeast corner Margaretta street and McDermot avenue, $6,000; B. C. Cockshott, dwelling, Harbison street, $2,800; W. W. Fleming, dwelling, Arlington street, $3,600; J. T. Watson, dwelling, Simcoe street, $2,000; J. T. Watson, 2 dwellings, Home street, $4,000; D. D. Wood, stone crushing plant, Ross avenue, $8,000; R. Cohen, two dwellings, Anderson street, $3,600; H. Picken, dwelling, Toronto street,, $2,500; I. Isenberg, 3 houses, Fleet street, $7,500; I. Isenberg, house, Aikins street, $2,500; B. Donnen, dwelling, Cathedral, ,$2400; B. Donnen, 2 dwellings, Bannerman, $4,800; Ogilvie Milling Company, addition to oatmeal mill on the south side of Higgins avenue, $10,500; Vulcan Iron Works Company, blacksmith shop, Mead street, $12,000; G. A. Eastman, warehouse, 40 by 60 feet, 3 stores, Young street, $14,000; F. J. Joslin and Wm. Toole, two houses, Atlantic avenue, $2,400; G. S. Smith, 2 houses, Jessie avenue, $4,000; A. Macdonald, two houses, Horne street, $6,000; F. D. Burns, 3 houses on Beresford avenue, $7,500; R. Shane, house, Aubrey street, $3,600.

AWARDED.

London, Ont.

The Waterous Company, of Brantford, was awarded the tender for a fifteen ton road roller to cost $3,000.

Tapering Concrete Chimneys

The majority of the numerous reinforced concrete chimneys that have been built are cylindrical in shape, due to limitation in the design of the forms, and where a variation in diameter is made this has been effected by an offset. Recently, however, says Engineering News, some special designs of form construction have been devised which permit the building of tapering stacks without excessive cost for this feature of the work. The forms, which are 5 feet high, consist of sets of rings, steel plate forming the surfaces, and long bolts by means of which the adjustments of diameter and wall thickness are made. The rings are of sufficient diameter to enclose the base of the chimney, and are made of heavy angles bent to varying radii and spliced into complete circles. The radial bolts must be long enough to permit of their extending into the chimney surface when the diameter is smallest (at the top of the chimney). The diameter of the rings remains constant, standard sets of form rings being carried in stock for various sizes of chimneys. The steel sheets are of standard size, and are filled out with split sheets, made interchangeable. The sheets are secured by flat-head stove bolts to vertical stiffeners on the outer surfaces of the forms, except at one rib, where the adjustment is taken up. The varying diameter is obtained by means of the long radial bolts which turn through small angles attached to the steel rings, and end in malleable clips which grip steel bands on the outside of kerfed wood strips which press the sheets in to the desired radius. Permanent centres are kept at the lines on the chimney and on the scaffold above, and each section of the chimney is plumbed. Thus perfect aligument is secured throughout the construction.

Qualifications of the Builder's Foreman

Desiderata for the Position : Thorough Technical Training, Ability to Preserve Harmony the Possession of " Influence " and Discipline

By Alfred Searle

The advent of machinery and of new methods of construction in the building trade is revolutionizing certain departments in a way which is too obvious to be overlooked and too small to be realized in all its fulness by those most concerned. In days gone by the primary qualification in a builder's foreman was his ability as a workman, and it was recognized that any young apprentice who had sufficient intelligence, and who was skilled at his work, might rise to the position. Within recent years, however, this has been altered so completely that some of the most successful foremen, employed by the largest firms, have only a superficial knowledge of the actual handicraft, and have been chosen more for their shrewdness and general capability of "seeing ways out of difficulties" than for their actual manual skill. Just as the clerk of the works is the technical representative of the architect or owner, so the foreman is the representative of the builder, and for this purpose a man skilled in the reading of plans, quick to see how to overcome those puzzling little problems which are always occurring, and which must necessarily, to a large extent, the unforeseen, and with sufficient personal "force" to have his instructions carried out promptly and satisfactorily, is worth far more, under modern conditions, than the best joiner, mason, or bricklayer who ever lived, if the latter was destitute of the qualifications just mentioned.

The Question of Mechanical Skill

So great has been the change, in fact, that it is questionable whether any serious importance is to be attached to the supposed necessity for mechanical skill on the part of the foreman, and whether the demand of modern building construction is not creating the need for a type of man which cannot be produced as the result of an ordinary apprenticeship to a trade.

The ordinary workman of to-day—especially if he be of the sort out of which the older foremen were made—is a man who thinks much and who does not hesitate to express his opinions. He may have been badly misinformed as to the true state of affairs in the relationship between capital and labor in the modern state, and may have various theories and ideas, either original or imported, as to what should be his true position in life, and if these ideas are sufficiently dominant they may prove as much of a hindrance to his success as a foreman as they were a blessing to him as a craftsman.

For this reason some employers are seriously considering the advisability of employing as foremen men who have been trained specially for the purpose in technical and other classes, but who have not any special skill as workmen. They are doing this because the foreman who is a strong upholder of his trades union is inconvenient from the employer's point of view, and consequently it is easier to get certain kinds of work superintended by men trained apart from the ordinary apprenticeship, than from those who have been promoted in the ordinary way.

This tendency is to be regretted, for it is based on a fallacy as to the fundamental duty of the foreman, and assumes (which is by no means correct) that the foreman's chief work is to keep the skilled and other workmen profitably employed and to prevent waste of time.

As a matter of actual fact, the foreman's true position is to stand intermediately between the employer and the individual workmen and to see that, as far as possible, the interests of both parties are fully secured. This is by no means so easy as appears at first sight, for the tendency is for the masters to overwork the men, or to make impossible conditions on the one hand, and for the workmen to "slack" and waste time (and therefore money) on the other. Hence one of the primary requisites in the modern foreman must be the ability to judge fairly any complaints or suggestions which must be received from either party, and to give a wise opinion thereon.

This implies the selection of middle-aged men as foremen, for younger ones are apt to fail in appreciation of the men's position, and to be so anxious to please their employers as to have but little influence on those who are, after all, their fellow workers.

Value of "Personal Force" or Influence

Indeed, "influence" is the keynote to the whole position. Without it a man may be extremely clever as a worker or as an organizer on paper. He may have ample knowledge of the technical side of his work, but he cannot get other men to work efficiently. One of the easiest ways for a foreman to lose influence is to prove his incompetency as a foreman, for there is nothing which makes it so easy to ridicule a man as to attempt to show another how to do a piece of work and to fail to do it himself. For this, if for no other reason, it would appear to be always necessary for a foreman to be a good all-round workman. Indeed, it is difficult to understand how a man can justly decide the wage-earning value of a particular operation unless he is able to do the operation himself, and thus know the amount of thought and care, as well as the actual time required.

Quickness of perception and the power to control other men are thus found to be only two out of many important characteristics required in a foreman; a thorough technical knowledge, not only of his own trade, but of all those allied to it. Perhaps if a single characteristic were to be selected as the one of greatest importance at the present time, it would be a sympathetic attitude to both masters and men, for with this a foreman will be able to influence both his employers and those under his charge. He will be able to see that justice is done between the parties, and by the judicious expression of his own opinion, based on his knowledge as a workman and as a technical student of both the trade itself and of economical problems affecting labor and capital, he will prove a valuable aid to the success of the firm employing him, and an equally valuable friend and adviser to those he is employed to direct. A truly sympathetic attitude will prevent him from favoritism on the one hand and excessive harshness on the other, and will be his chief means of carrying out his duty with the least friction. It will enable him to suggest improvements to his employers in matters of construction and arrangements, and to effect economies in costs without undue hardship on the workmen.

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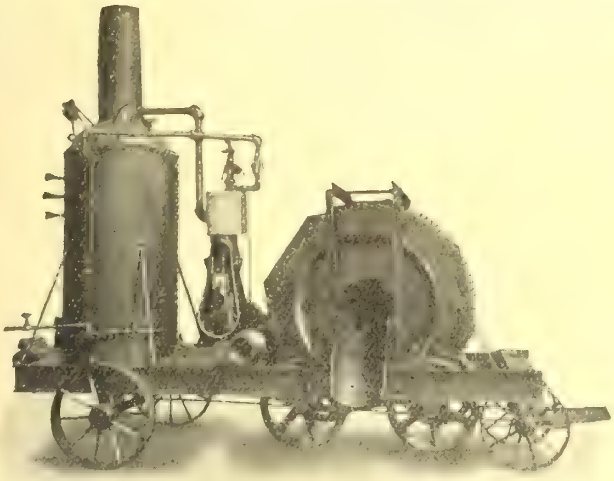

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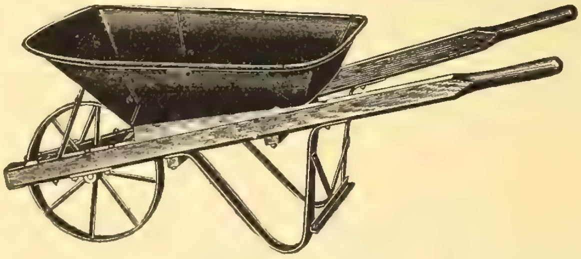

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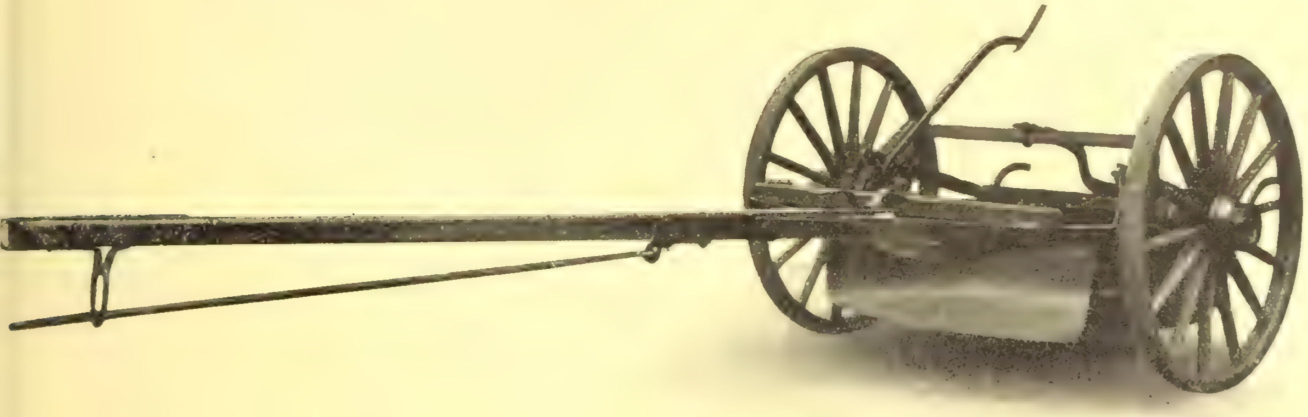

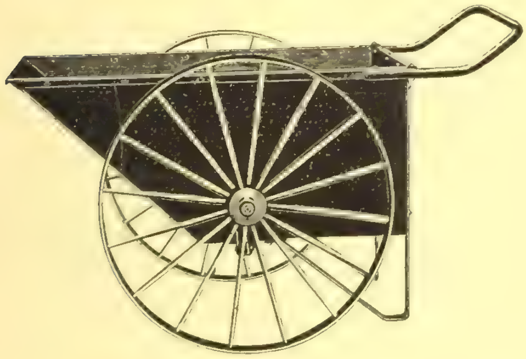

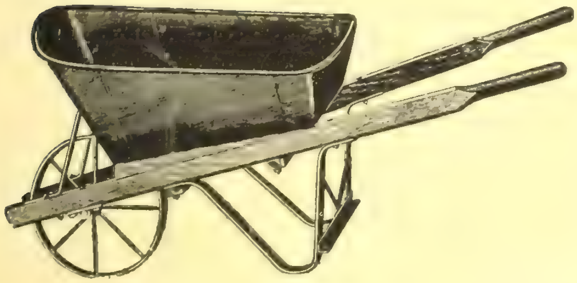

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Number and Gauge of Wires, Areas Per Foot Width and Weights Per 100 Square Feet.

Styles Marked * Usually Carried in Stock

Style Number	No. of Wires Each Long	Gauge of Wire Each Long	Gauge of Cross Wires	Sectional Area Long. Sq. In	Sectional Area Cross Wires	Cross Sectional Area per Ft. Width	Approximate Weight per 100 Sq. Ft.
* 4......	1	6	14	.087	.025	.102	43
5......	1	8	14	.062	.025	.077	34
6......	1	10	14	.043	.025	.058	27
* 7......	1	12	14	.026	.025	.041	21
*23......	1	¼"	12½	.147	.038	.170	72
24......	1	4	12½	.119	.038	.142	62
25......	1	5	12½	.101	.038	.124	55
*26......	1	6	12½	.087	.038	.110	50
*27......	1	8	12½	.062	.038	.085	41
28......	1	10	12½	.043	.038	.066	34
29......	1	12	12½	.026	.038	.049	28
31......	2	4	12½	.238	.038	.261	106
32......	2	5	12½	.202	.038	.225	92
33......	2	6	12½	.174	.038	.196	82
34......	2	8	12½	.124	.038	.146	63
35......	2	10	12½	.086	.038	.109	50
36......	2	12	12½	.052	038	.075	37
*38......	3	4	12½	.358	.038	.380	151
39......	3	5	12½	.303	.038	.325	130
40......	3	6	12½	.260	.038	.283	114
41......	3	8	12½	.185	.038	.208	87
*42......	3	10	12½	.129	.038	.151	66
43......	3	12	12½	.078	.038	.101	47

Special Sizes on Application

LENGTH OF ROLLS: 150-ft., 300-ft. and 600-ft.

WIDTHS: 18-in., 22-in., 30-in., 34-in., 42-in., 46-in., 50-in., 54-in. and 58-in.

LONGITUDINAL SPACED 4-INCH CENTERS
CROSS WIRES SPACED 2-INCH CENTERS.

Number and Gauge of Wires, Areas Per Foot Width and Weights Per 100 Square Feet.

Styles Marked * Usually Carried in Stock

Style Number	No. of Wires Each Long.	Gauge of Wire Each Long.	Gange of Cross Wires.	Sectional Area Long. Sq. In.	Sectional Area Cross Wires. Sq. In.	Cross Sectional Area per Ft. Width.	Approximate Weight per 100 Sq. Ft.
4-A....	1	6	14	.087	.050	.102	53
5-A....	1	8	14	.062	.050	.077	44
6-A....	1	10	14	.043	.050	.058	37
* 7-A....	1	12	14	.026	.050	.041	31
23-A....	1	¼"	12½	.147	.076	.170	86
24-A....	1	4	12½	.119	.076	.142	76
25-A....	1	5	12½	.101	.076	.124	70
26-A....	1	6	12½	.087	.076	.110	64
27-A....	1	8	12½	.062	.076	.085	55
*28-A....	1	10	12½	.043	.076	.066	48
29-A....	1	12	12½	.026	.076	.049	42
31-A....	2	4	12½	.238	.076	.261	120
32-A....	2	5	12½	.202	.076	.225	107
33-A....	2	6	12½	.174	.076	.196	97
34-A....	2	8	12½	.124	.076	.146	78
35-A....	2	10	12½	.086	.076	.109	64
36-A....	2	12	12½	.052	.076	.075	52
38-A....	3	4	12½	.358	.076	.380	165
39-A....	3	5	12½	.303	.076	.325	145
40-A....	3	6	12½	.260	.076	.283	129
41-A....	3	8	12½	.185	.076	.208	101
42-A....	3	10	12½	.129	.076	151	81
43-A....	3	12	12½	.078	.076	.101	62

Special Sizes on Application

LENGTH OF ROLLS: 150-ft., 300-ft. and 600-ft.

WIDTHS: 18-in., 22-in., 26-in., 30-in., 34-in., 38-in., 42-in., 46-in., 50-in., 54-in. and 58-in.

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Vol. 24 Toronto May 11, 1910 No. 19

The Empire's Bereavement

In the irreparable loss which the British Empire has sustained during the past week the hearts of all English-speaking people beat as one. That touch of nature which makes the whole world kin has come to us and we are united in a common sorrow. We mourn to-day the death of him who was "of the British Dominion beyond the seas, King," enthroned in the heart of every good Canadian as loyally as in any other British breast. King Edward was possessed of truly kingly qualities and his noble conception of his duty to every portion of the Empire and the able manner in which he carried out that duty have welded another link in a chain which, let us hope, may never be broken. Our sympathies are extended in human tenderness to the Queen-Mother and the other members of the Royal Family and our hopes are placed unreservedly in His Majesty, King George V., in the full confidence that the abilities of the father have been transmitted to the son, even as these in turn were inherent by our late King. Our late King! The words are hard to utter. Truly it were not altogether inappropriate, if somewhat inadequate, to write of him:

"This was a man."

Certified Cheques with Tenders

The introduction into Montreal of the system of enclosing accepted cheques with tenders for city work has proved decidedly unpopular in that city. Last week a number of sewer contractors went to the City Hall and expressed their sentiments. They contended that the new system would be a hardship to many of them as they could not afford to have a great deal of money tied up for any length of time. They suggested that the Board of Control should not insist upon cheques, but should accept bonds from guarantee companies. The controllers promised consideration. Whether this is as far as they will get remains to be seen. Our best wishes for the success of the Montreal contractors will be shared by many in other sections who have experienced the same rub.

To illustrate how a safeguard may be turned into a serious hardship upon the community, the security required to be deposited as a qualification for bidding in the case of Government work in some countries is a large per cent. of the approximate contract price, and this sum is retained until completion of contract. It is apparent that in a very large piece of work there might be but one bidder who could post the required sum as a guarantee. To offset this, the law ordinarily requires more than one qualified bid as a condition to awarding the contract. It will readily be seen, however, that a wealthy bidder could get around this and secure the work at his own price by the simple expedient of making the necessary financial arrangements, and having a dummy bid submitted at a higher figure than his own.

If it is necessary to have temporary security the amount should be determined by the size of the contract and by local conditions. It is a mistake, obviously, to make the amount so high as to exclude from competition the man who can undoubtedly carry through the work, but who may be embarrassed by the necessity for tying up, even temporarily, a large part of his working capital.

Importance of Keeping Well Posted

If the writer learnt his lesson thoroughly, it was Dr. Johnson who asserted his ability to size a man up by a knowledge of his acquaintances. Certainly if we are to judge a man by the company he keeps, he will be found to be up to the minute by a regular perusal of a live publication that has his interests at heart. You probably know a contractor who is always in touch with the newest and best that is offered for sale; who is able to explain to his customers just what has been placed on the market, and why it has the particular advantages that have been claimed for it. This man is the one who keeps himself posted by reading his trade publication.

While this may seem somewhat useless by the man who has not considered it in the light that he should, a little thought on the subject will suffice to prove that the time devoted to the trade journal is so much time devoted to improving one's resources and business.

This is a fact that is now realized to a much greater extent than previously, and on this account the progress made by the contracting fraternity is growing apace with gratifying headway. There will continue to be progress in the same way so long as the contractors find the need of this method of getting an insight into the development of their business. Once understood, there is no further need to coax the contractor who has learned his lesson. He sees that there is logic in such advice, and his returns have been far greater than the time and small outlay that the trade publication has cost him.

LE ROI EST MORT—VIVE LE ROI

"The King is dead—with knell of passing day
He crossed into that bourne from which
No traveller, howso exalted, may return,
Leaving a nation—nay he left them all
Sorrowing that the world had lost a King indeed.

We who remain—
Following the ancient rule, may shout in time
"Vive le Roi!"—but for a cloud of years
There will remain a pungent sorrow in the words:
'The King is Dead.' "

Painting Iron Bridges

J. M., Halifax, N.S., has difficulty in finding a suitable paint for iron bridges. He writes the "Contract Record" as follows:

"For the past two years I have been engaged in looking after the roads and smaller bridges in the Province of Nova Scotia. I have also the painting of the larger iron bridges, and I have had great difficulty in selecting a suitable paint, especially for those bridges along the sea coast. They appear to corrode in a very short time. At present I am testing several paints by making a strong bath of salt and other materials contained in the sea-moisture, as found by analysis of same, but I would not like to put the results in print. I have also been testing petroleum oils with regard to making them waterproof—I have used as much as 8 per cent., but not with as good results as with 10 per cent. Can you help me out?

It is generally admitted by engineers that properly treated linseed oil is the only suitable liquid to be used in a steel bridge. Having decided on the oil, the next important question is the pigment. It is essential that the pigment be of such a character that it has no chemical action on the oil, by which its life would be lessened. It must be of a fine texture, that it will readily incorporate itself with the oil, so as to brush out into a smooth film of paint.

It is now conceded by those who have made a study of bridge painting and other structural steel work that specially treated graphite possesses all the qualities that make it the most desirable paint pigment. It is inert in its character, and capable of being combined with the oil in such a way that it becomes inseparable under use, and withstands disintegration for the longest period. A paint composed of specially treated graphite, combined with a quality of oil as described, will retain its elasticity for the longest period, conforming to the expansion and contraction of the metal under different atmospheric conditions.

The trouble with so many steel bridges is that the engineers are constantly experimenting with products of a coal tar nature. No such paint possesses qualities that make up a durable or protecting coat for steel. The film of paint hardens quickly and separates itself from the steel, allowing the moisture to get underneath and set up a rust, which may go on unseen for considerable time while the surface may still remain unbroken to any great extent

Then again, the greatest care must be taken to see that the surface is in proper condition to receive paint and the weather suitable for application. All surfaces should be thoroughly free from all mill scale and rust, which can be removed by cleaning with wire brushes, and all grease, dirt, etc., should be removed by a cloth saturated in benzine. After thoroughly cleaning in this manner, the work should be immediately proceeded with, by giving a thin coat of paint. After allowing it to stand for three or four days, until it is thoroughly dry, the second coat should be applied. No painting should be permitted on damp surfaces or in wet or frosty weather, as poor results are bound to result.

The matter of brushes is another important feature. The use of large flat brushes is not approved because the paint is flowed on, but instead, a round brush should be used, by which the paint is thoroughly brushed into the surface.

Where bridges are in close proximity to salt water an incrustation of salt will quickly appear on the surface of the paint, and while this tends to shorten the life of the paint it will have no bad effect on the steel so long as it does not get under the paint. The paint is applied for the purpose of keeping just such elements away from the steel itself, thereby protecting it, and the life of a paint then depends upon the severity of the exposure. Bridges so situated should be carefully watched so as to determine the time when they need repainting, which will be of more frequent occurrence than where they are situated under exposure not so severe.

The Sherwin-Williams Company have produced a paint in "Metalastic," which is being used with good results. It is clear, however, that no matter how good the paint is if the surface has been previously coated with some of the coal tar products, or red oxide paints, unless this is first removed and the new paint applied in a proper manner, under suitable weather conditions, the paint will not prove as durable as it would under favorable conditions, in fact, a bad report is almost sure to follow unless all care is taken to see that surfaces are right and weather conditions are suitable.

The Work of Brick Masons at Boston

A comparison of the number of brick laid per mason per hour and the cost of the work (referred to a uniform wage unit) upon the Metropolitan sewerage works, which are largely built by contract, and upon work done by the sewer division of the Boston Street Department by day labor and by contract, is given in a report of Messrs. Metcalf & Eddy to the Boston Finance Commission. The calculations are based upon the assumption of 600 bricks per cubic yard of masonry, and a wage rate of 70 cents per hour, which does not include an allowance for tending masons, handling brick on the surface, or mixing mortar.

The highest cost on the Metropolitan sewers was $4.23 per 1,000 brick on a 36-inch circular sewer with 8-inch arch and 4-inch invert, built by cantract. The next highest was $3.13 per 1,000 for a 3½-foot sewer where an 8-inch arch only was constructed of brick. The largest sewers, with 4-inch invert, cost on the average only $1.92 per 1,000 brick for mason labor. On work done by day labor by the city of Boston the next to the lowest unit cost for brickwork was $9.48 on a drain 12 feet in diameter, with 16-inch brick arch and an invert frame 12 to 16 inches thick. Work done by contract on the Metropolitan sewer, which is comparable to that just noted, done by the city by day labor, cost only $2.12 per 1,000 brick, or less than one-quarter of the amount where city labor was used. The average cost of four sections done by contract was $1.92, or about one-fifth of the cost of similar work done by the city. A comparison of the smaller sewers built by the Metropolitan Commission with those built by the day labor force of the city shows that the former cost from $2.77 to $4.23 per 1,000 brick and the latter from $9.04 to $18.34.

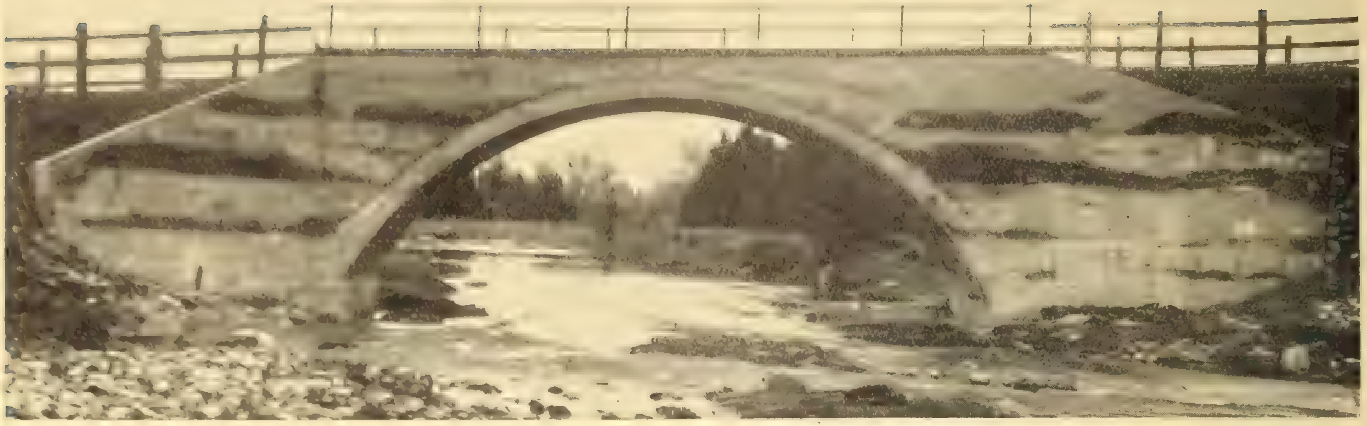
On some of the city work the average for a whole week showed that in some cases as few as 13 bricks per mason per hour were laid; the maximum was 242. On the Metropolitan work the number ranged from 94 to 570. The highest number per hour for the average of an entire job done by the city was 78, whereas the lowest upon the Metropolitan was 165 and the highest 384. Messrs. Metcalf & Eddy call attention to the fact that weeks when no brick were laid have been omitted in computing the hourly rates, and attribute the result not wholly to lack of willingness on the part of the masons, but to poor management on the part of those who were in charge.

Metcalf & Eddy believe, as a result of their investigations, that the total cost to the city of brick masonry in sewers is over $18 per cubic yard; a fair price to pay for Portland cement concrete, they think, would not be in excess of about $8 per cubic yard.

Proposed Standard for Cast Iron Pipe

In regard to the above subject the Canada Iron Corporation, Limited, Montreal, write us as follows:

"We may say that over two years ago, we adopted as our standard the specification of the American Waterworks Association, which is the specification that the Canadian Society of Civil Engineers have virtually decided upon as a Canadian standard. This, in our opinion, is the best specification for both the manufacturer and consumer, and it has already been adopted by a great many towns and cities throughout Canada."



40 ft. Concrete Arch with 14 ft. roadway at East Whitby, Ont., cost $2,160.

Reinforced Concrete Municipal Bridges

With Illustrations of Typical Structures—Economy of Cost, Permanency and other Advantages of this Construction—Notes on Design*

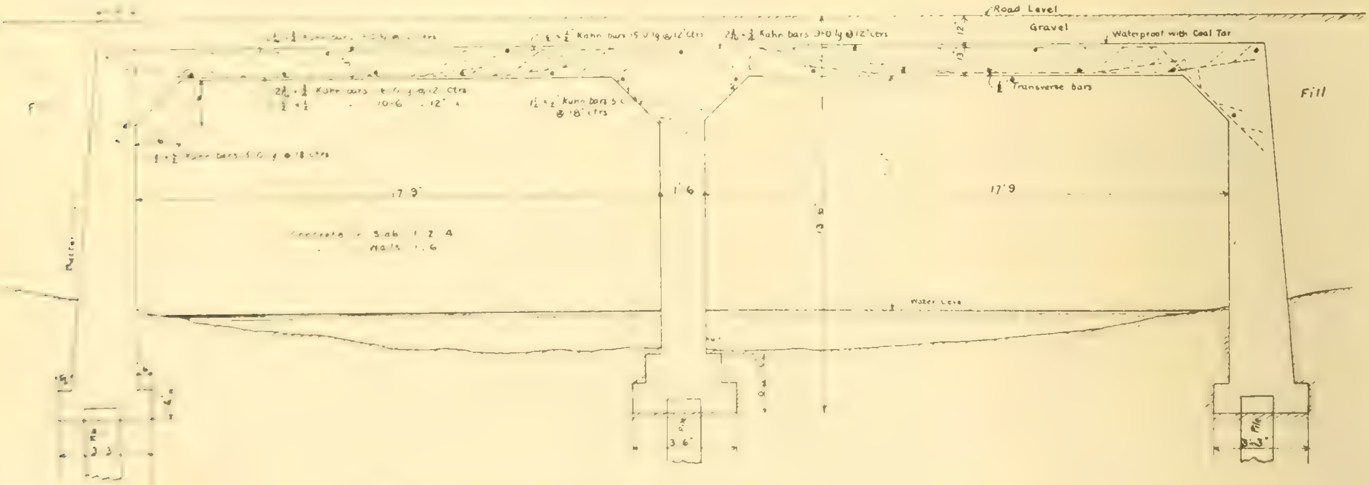
By A. W. Connor, of Bowman & Connor, Consulting Engineers, Toronto.

The use of concrete for bridge work has increased very rapidly within the last few years. The municipalities have now become interested in concrete, as they see more and more of its successful use in various structures. While the advance has been rapid, there is every reason to believe that the very popular position which this building material has attained will be maintained.

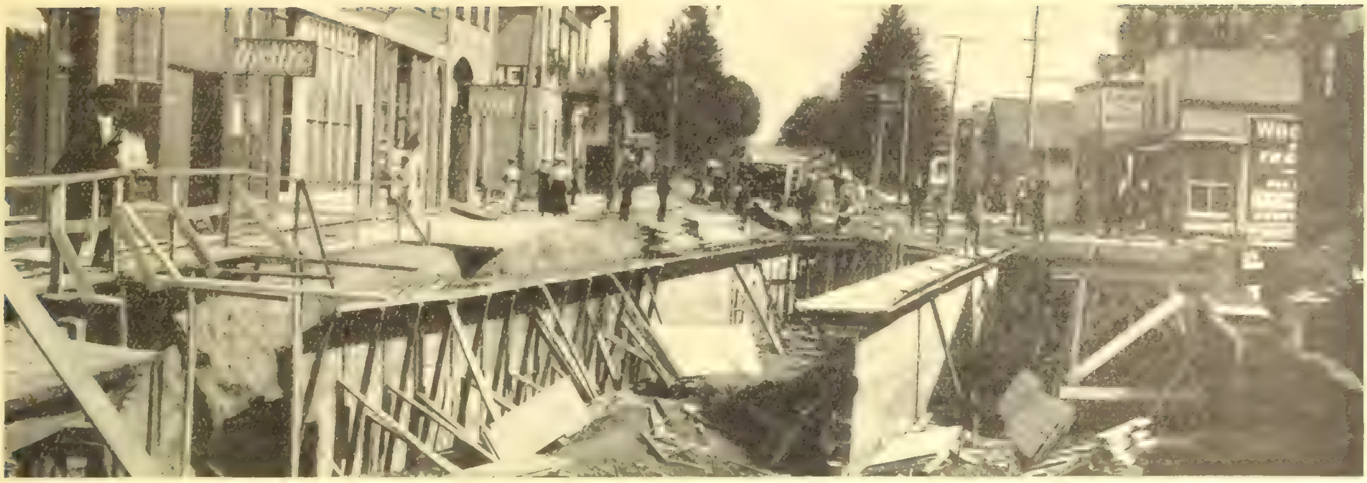
The concrete bridge appears to have come in as a cheap substitute for the masonry arch, but it was soon realized that it had a status and individuality of its own. It has practically supplanted the masonry arch, except occasionally for facing a concrete structure.

It has also proved a very strong competitor with the steel bridge. Each type of bridge has its own place according to local conditions. For short spans the cement bridge is generally cheaper than the steel bridge with concrete floor and substructure. Where good foundations are obtainable, the concrete bridge has been found to compete successfully up to spans of about 100 feet. Cost is, of course, not the only consideration, and many long span concrete arches have been successfully built, and others and larger ones are contemplated. The results of these large undertakings will be watched with much interest.

The concrete bridge has much to recommend it. It is a permanent structure, economical in the first cost and requires no expenditure for maintenance. It is perhaps the only structure that improves with age. On account of its greater weight, there is practically no vibration due to moving loads, and floods are unable to dislodge it. It is also fireproof. In most cases the ordinary roadway is built right across, so that one might never notice the bridge in driving over it. This is an advantage in driving cattle across it. Another advantage of the concrete is its superior appearance and its adaptability to architectural treatment. As the concrete bridge is a permanent structure, it seems a mistake to spare the relatively small extra expense in order to improve its appearance, by a little extra care in tht surface treatment and by building a concrete railing instead of a cheap gas pipe rail. The reinforcing steel will also outlast the steel in a steel bridge on account of its being protected from rust, and also being subject to less vibration.



Section of Culvert erected at Listowel, Ont.—Length about 311 ft.



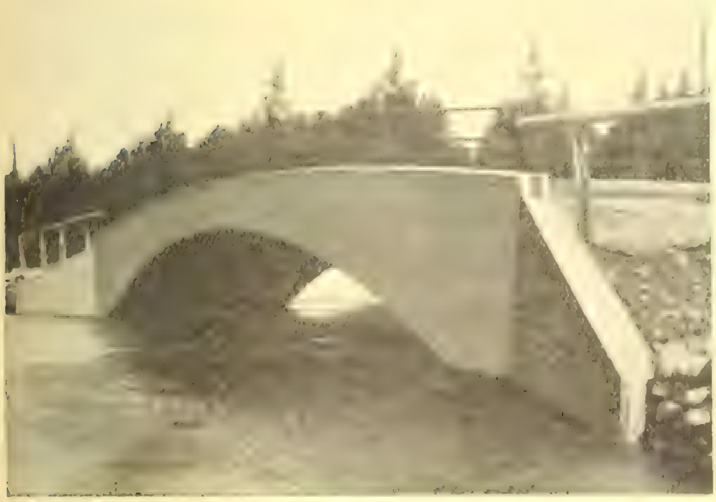
Listowel Culvert in course of construction—This culvert was built to replace an old wooden pile structure which carried a small stream down the main street of the town.

The merits of the concrete bridge above mentioned are, of course, conditioned on proper design and careful and honest handling of the materials. No building material can give good results unless it is properly used. Some failures have resulted from the neglect of one or both of these points.

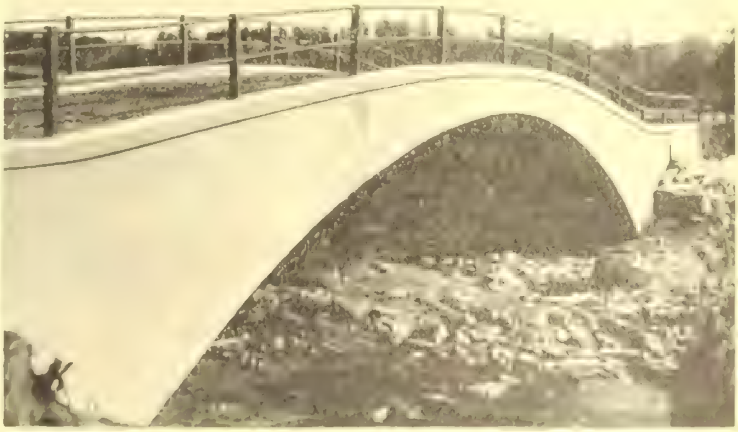
The simple lines of the concrete bridge has led men to think that anyone can draw a plan of a concrete bridge, and that a little steel buried somewhere in the concrete will give it infinite strength. As a matter of fact, the concrete structure requires greater knowledge and experience, and certainly more calculation than a similar steel bridge. The best, as well as the most economical structure, results from careful design, by which every part of the structure is of equal strength and where all the material is so placed as to have its maximum efficiency. This requires both theoretical and practical knowledge of every detail of the construction by the designer. The cheapest plan is always the most expensive in the long run.

The limits of this paper forbid any attempt to describe the methods of calculation, so only a few words will be said. The bridge must be designed to carry its own or the dead load, and the moving or live load. This latter is usually taken as so much per square foot of the floor or of a concentrated load such as a road roller or traction engine. The load assumed will depend on the present and possible future traffic. Every possible condition of loading must be considered. Paradoxical as it may seem, the full load does not cause the greatest stress in parts of the structure. Another stress that has to be figured on is due to expansion and contraction from temperature changes. The effect of wind and impact has also to be considered, though in the heavy concrete structures these are of less importance. The sum of all the stresses that may result must always be within the safe limit for the steel and the concrete. What those limits should be is not very definite, different engineers differ in their judgment of what will give a sufficient factor of safety. Doubtless further testing and experience will lead the way in this matter, and a specification may be drawn up and generally adopted. Equal attention must be given to the abutments. The thrust from an arch must be calculated, and the size of the abutment determined so as to make it stable and rigid. The higher the arch is above the foundations, the larger will the footings be. Also the flatter the arch, the greater will the thrust be, and the larger the abutments. The bulk of the abutments is sometimes reduced by using reinforced butresses, instead of the solid construction.

Due care in construction is also essential, in order that the assumptions of the designer may be fulfilled. Carelessness still prevails in this regard, as it is often thought that anyone can mix and handle concrete.



Arch Bridge near Eden Mills, Ont. Clear span 50 ft; width of roadway 14 ft; cost $1,450.



Arch Bridge at Eramosa Township. Clear span 60 ft; width of roadway 14 ft; cost $1,270

While it can be handled by unskilled labor, it requires skill and vigilance on the part of the foreman and competent inspector. Every batch must be of properly proportioned materials and well mixed and deposited in place. This cannot be too strongly emphasized.

The bulk of materials required are generally close at hand and local labor is also used in the construction. The principal materials used are cement, sand, stone or gravel, water and steel, and wood for the forms and bracing. The method of construction will be dealt with by another speaker. The cement should be the best Portland cement, and it should always be specified that it shall fulfil all the requirements of the Standard Specifications of the Canadian Society of Civil Engineers. The sand and stone or gravel should be properly proportioned and mixed, so that all the voids are filled. If the sizes of these materials are properly graded, the less will be the percentage of voids and the less cement may be used. Usually these proportions are specified by volume, regardless of the material used or without stating whether the cement is measured loose or not. This is a mistake. For larger work careful measurements should be made and tests made to determine the proportions to obtain the strongest concrete. The requirements for the various materials will not be dealt with further in this paper.

42 ft. arch bridge at Durham, Ont; 40 ft. roadway, concrete retaining walls about 300 ft. long; cost, arch only, $2,360.

There is a good deal of controversy as to the best kind of steel for reinforcing concrete bridges. It may be prefaced that steel is used to take up tensile and stresses and the concrete to take up the compression. The steel and concrete will each take up the other stresses also, but each is cheaper in its own field. This is the raison d'etre for reinforced concrete.

The concrete protects the steel from rust. Into the controversy of the kinds of steel to be used, we cannot enter, but merely mention the principal types briefly. The steel should be made by the open hearth, not by the Bessemer process.

The first division is between high carbon and medium steel. The former has a higher strength and elastic limit, but is more brittle and cannot be so readily fabricated. The medium steel is what is used in steel bridge work, and is less liable to sudden failures. The advocates of high carbon steel, claim that less steel may be used, but it is a question if the higher stresses in the steel, with consequent greater stretching and reduction in area of the steel, will not injure this concrete by producing larger cracks in the concrete (and possibly, therefore, impair its rust-resisting properties), and also have a greater tendency to break the bond of the steel and concrete. It is claimed that this has happened to beams after being in use for some years. The writer considers it best to be conservative, and not allow higher unit stresses until time has justified the higher stress.

The second division is between the various patented shapes of bars made of either high carbon or medium steel. There are the plain unpatented bars, the conjugated bars and bars with stirrups which are patented.

The purpose of the conjugated bar is to increase the bond of the steel to the concrete. The stirrup, whether a part of the bar or rigidly fastened to it, will also do this, and also take up the shearing stresses. That the bond is essential is beyond question, for it is only thereby that the steel can take up its load. This bond must also be continuous for the increment in tensile strength must come from the horizontal shear in the concrete at all points. That plain bars have sufficient bond, and if bent up at the ends of a beam to take up the maximum shear are satisfactory according to tests made, is also true, but laboratory tests are not entirely conclusive, as to the effect of continuous loads and shocks received during a number of years. Steel certainly acts differently under repeated loads. It is felt therefore that a conjugated bar offers a greater security than a plain bar, and stirrups even greater. The conjugations increase the bond. The bond is reduced by moisture, vibration and reduction of sectural area of steel in tension. The stirrups also take up the shearing stresses throughout. Concrete is not very reliable in shear, and less so if of poor workmanship. Besides the above styles of bar, plain twisted steel bars are largely used. They are, therefore, like a corrugated bar, and though of medium steel, have their strength and elastic limit increased by the process of twisting.

The desirability of a good surface for appearance is evident. This is usually done by careful work in forms and working the stones away from the surface with a suitable tool. This is better than afterwards plastering the surface. Another method is to use a richer outside mortar, white or colored as desired. This is done by putting it outside of a steel plate near the forms, and gradually raised up as the work progresses; another scheme is to rock face or brush hammer it. Another desirable feature is to use a handsome concrete railing, either separately moulded or moulded in place. The concrete bridge is thus capable of very artistic treatment.

21 ft. 6 in. skew through culvert, between Counties of Grey and Wellington. 14 ft. roadway.

We will now briefly describe the various types of concrete bridges.

(a) Reinforced slabs are largely used for short spans.

(b) Deck girder bridges with slabs over the beam resting on concrete abutments. These are suitable up to about 40 feet span, and are generally cheaper than an arch if the foundations are not good.

(c) Through girder bridges similar to the above but with floor near the bottom and carried by two girders which also act as hand rail. This type is suitable where the water-way is limited.

(d) Concrete slab and beams where steel I beams are used instead of reinforcing steel. This is not strictly a concrete bridge, as the steel beams carry the load and the concrete is only for the protection of the steel.

(e) The arch. This is the most popular type and may be divided into arches with or without hinges. The hinged arch is rare in this country, most examples occurring in Europe. The arch without hinges is the usual type in this country and the arch ring may consist of a single monolithic ring or a number of ribs. The roadway may be carried on fill held in by the spandrel walls, or it may be carried on a concrete slab, or a series of subsidiary arches on top of the main arch ring or arched rib or on a series of beams and columns.

The spandrel filled arch is the most common and is suitable for shorter spans, and the slab style for long spans. In cases where the foundation is less reliable, the weight of the structure may be considerably reduced by using a slab or beams and columns, as for longer spans, but with solid spandrel walls.

The shape of the arch may be circular, parabolic or elliptical. The circular arch is the usual type, either segmental or three or five centered. Where the rise is small it may be figured as a parabolic ring, which is simpler than the circular ring.

The rise of the arch should be at least one-tenth of the span. The greater the rise, the more economical the design.

Provision should be made for expansion. The spandrel walls of arches should have expansion joints or plains of weakness. It is our custom to have the spandrel walls separate from the arch ring, but fastened thereto with dowels. This allows the arch ring to rise and fall with temperature changes.

The top surface of a concrete bridge should be waterproofed by plastering with a 1 to 1 mortar before the concrete has set or by coating with pitch or asphalt. Any place where water might lodge should be drained.*

Concrete Not Always Adaptable

Concrete bridges are, as a rule, not believed to be adapted to locations where the traffic or channel beneath them must be left unobstructed during construction, says the "Engineering Record." In the case of two large bridges erected recently an open channel has been maintained by the use of steel centering, and in the Harrisburg Viaduct a system of cantilever steel forms was devised which had sufficient strength to support the green concrete. For low concrete bridges the forms are generally supported by posts or towers placed at short intervals across the span, and in consequence the channel is obstructed or the traffic interrupted. When it became imperative some time ago to replace the timber bridges carrying cattle runways across railroad tracks and streets in the Union Stock Yards, Chicago, the authorities wished to use concrete, though conditions, apparently, were unfavorable. The railroad tracks over which these runways are carried have an unusually heavy traffic, both night and day, which could not be interrupted. The tracks, too, are so close together that posts or towers could not be placed between them for the support of the centering. On the other hand, the traffic on the runways themselves could not be delayed, since they are the only entrances from the cattle pens to the slaughtering and packing houses and for about 8 hours every morning carry an uninterrupted procession of animals. The entire stock yards area, moreover, is so closely built up with large industries that it was manifestly inadvisable to change the locations of the runway bridges. The solution of the problem, by the use of three-hinged arch viaducts, is described elsewhere in this issue. The ribs were cast on the ground in a convenient place, loaded on flat cars, conveyed to the site and erected by a derrick. With the ribs in place the suspender rods and floorbeams were hung, and all form work was carried by the ribs without any support from below. The design was so handled that the new bridges could be built around the existing runways without interfering with the traffic on them. While interesting in itself as the solution of a difficult construction problem, the design also indicates a type of reinforced concrete construction which may be found applicable in many cases where ordinary methods of erection would be objectionable on account of the interference of the supporting posts and towers.

Long Span Concrete to Bridges

"The Builder" (London) says that within recent years concrete has become a serious competitor with masonry in the construction of long-span arches. At least nine concrete arches, with spans ranging from 187 to 280 feet, have been built on the Continent and in America. Two other notable bridges in the same material are about to the commenced—one of these for the city of Spokane, Wash., containing an arch of 281-foot span, and the other for the city of Pittsburg, having been designed with a 300-foot arch. The Rocky river bridge at Cleveland, Ohio, with the span of 280 feet, is nearing completion at the present time. Several of the structures to which we refer are reinforced to some extent by steel, others being of plain concrete. Although British engineers have not yet attempted any rivalry with their confreres abroad in respect of gigantic concrete arches, it must not be supposed that they have neglected the claims of that material in bridge building. Four or five reinforced concrete arches or nearly 100-foot span have already been constructed; a fine highway bridge was completed last year at Pontypridd with a centre arch of 117-foot span, and the new bridge commenced at Kilkenny will have the clear span of 140 feet, this being the longest arch in reinforced concrete hitherto undertaken in the United Kingdom.

New Quebec Bridge to be of Cantilever Design

According to a despatch from Ottawa, the new Quebec bridge will be of cantilever design and tenders will be called for by public advertisement in the leading engineering journals of Canada, the United States and Great Britain in the course of a few days. The Minister of Railways received a cable from Engineer Fitzmaurice, who is now in England, stating that after consultation with his colleagues, Modjeska and Vautelet, the other members of the board of experts appointed by the Government to supervise plans and construction of the new bridge, they had agreed that the tests which have been recently made, both in England and the United States as to the suitability of the cantilever design submitted last fall by the Board of Engineers, showed that it was the best possible. Tests have also been made of the suspension design, but the engineers have decided in favor of the cantilever. About three months' time will be given for tenders to be submitted, and all tenderers must comply with the condition requiring a sufficient guarantee that the bridge will be constructed strictly according to specifications, and that in case of any failure the contractor will be liable for all loss.

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* Paper read before Canadian Cement and Concrete Association. Illustrations courtesy of author and Trussed Concrete Steel Company.

Fine New Office Building at Montreal, Que.

Erected for the Lake of the Woods Milling Company on St. Sacrament Street—Particulars of Design and Construction

Architects: Ross & MacFarlane, Montreal

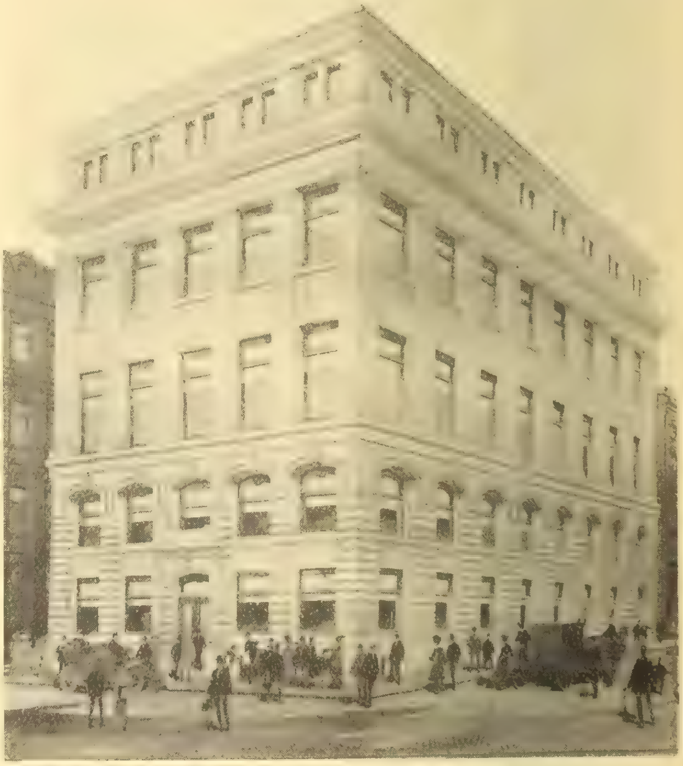
A handsome and substantial addition to the number of down-town office buildings at Montreal, Que., has been made in the erection of a building for the Lake of the Woods Milling Company on St. Sacrament street, immediately opposite the Board of Trade Building. It also has frontages on St. Alexis and St. John streets, giving it a situation and aspect that makes it prominent in a district that is quite closely built. The old Corn Exchange formerly occupied the site, and the walls of the lower storeys have been retained, as they were found substantial and adapted to the new additions above. The interior has been entirely removed and from the foundations up is built in fireproof materials of steel and concrete. The upper portion has been built with the Leeds Fireclay Company's unglazed terra cotta. The design is classic and the maximum of light has been provided, preserving at the same time good proportions and safe construction. Two passenger elevators run from the basement to the several floors above, and iron stairs provide similar communication. All corridors and stair halls are paved with mosaic and marble.

The interior of this building has been laid out in suites of offices for the occupation of several leading business firms in the city, and special interior finish has been designed and set up to suit the requirements of the respective tenants, and especially in the office of the Lake of the Woods Milling Company, where quartered oak pilasters and panelling have been used in their decoration. Private offices have been finished in mahogany and the electric light fixtures are of special design. Cork flooring has been provided in the clerks' space and mosaic and marble have been used in a decorative way.

During the course of construction it was found necessary to support and underpin adjoining part walls, and also to underpin the foundations of that portion of the masonry which has been retained.

It is worthy of mention that operations were begun in October and that the building was turned over to the owners and the tenants for occupation on the first of May. Considering the fact that this building was erected during the winter months, that it is a fireproof structure and that the material used in the exterior walls has been imported from England, and having in mind also the amount of interior work of a special character, a record has been established in point of time that will compare favorably with those made on similar structures in any other city.

The general contract was awarded to J. H. Hutchison. Among the sub-contracts may be mentioned the following: Carpentry, Simpson & Peel; roofing, Richardson .& Simard; plumbing and steamfittnig, Garth Company; tiling, Calkins Tile & Mosaic Company; painting, J. N. Arcand; electric wiring, Philip Lahee & Company; architectural ironwork, John Watson & Son; elevators, Otis-Fensom Elevator Company.



Lake of the Woods Building upon completion

View taken at the commencement of operations.— Showing part of old walls retained.

I-beam columns used in the temporary one storey machinery building of the Brussels Exhibition, which is about to be opened, have been built so that no damage is done to the I-beams, thus increasing their value when the buildings are torn down. Two I-beams are used in each column and are held together by clamps around the flanges, cast-iron plates being placed inside at the same level as the outside clamps in order to act as spacers. These columns are seated on cast iron base plates resting on a concrete foundation.

Cost of a 48-inch Cast Iron Force Main

A 48-inch cast iron force main, 18,181 feet long, was laid during 1908 and 1909 in the low service district of Detroit, Mich. The work, for which the contract price was $22.95 per ton, occupied slightly less than twelve months, the progress averaged 63.8 lin, feet per day, and the cost per lineal foot to the city, as given by Mr. George H. Finkell, civil engineer, in the last annual report of the Board of Water Commissioners, was $17.43.

Where the line crossed the old Bloody Run, seven 4 x 5-foot concrete piers, 36 feet on centres and having a maximum height of 10.4 feet, were put in to secure a solid foundation. Between each pair of piers the pipe was supported on a reinforced concrete beam 3 feet 6 inches by 4 feet in section and 35 feet 6 inches long. Each pipe was subjected to a test pressure of 300 pounds per square inch at the foundry and 100 pounds after being laid and caulked.

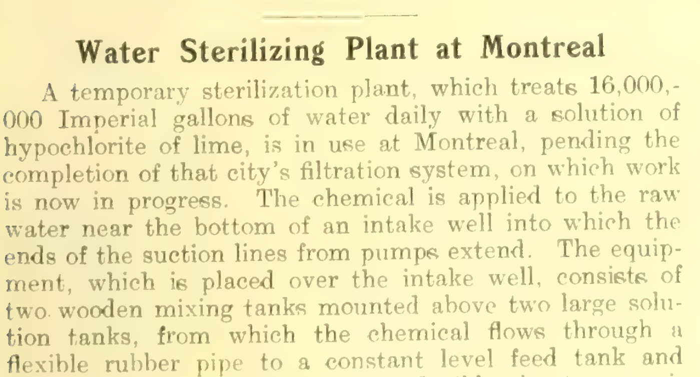
After the line had been completed and filled, a section of 48-inch pipe 14,907 feet long, containing 1,360 48-inch joints, seven 42-inch joints, two 36-inch joints and 38 12-inch joints, was tested for leaks by feeding the entire section through a new 1-inch meter for 20 hours. The amount supplied was 690 cubic feet, or at the ratio of 258 gallons per hour.

The total cost of constructing the 18,181 feet of 48-inch main was $316,835, distributed as follows: Pipe, $168,339.90; specials, $6,367.59; lead, $8,459.64; gates, $8,403.22; miscellaneous, $3,211.60; wells, including labor, $8,693.52; cartage, $10,617.63; outside bills, $2,074.38; superintendence and engineering, $7,721.94; labor, not including wells, $92,946.03.

Water Sterilizing Plant at Montreal

A temporary sterilization plant, which treats 16,000,000 Imperial gallons of water daily with a solution of hypochlorite of lime, is in use at Montreal, pending the completion of that city's filtration system, on which work is now in progress. The chemical is applied to the raw water near the bottom of an intake well into which the ends of the suction lines from pumps extend. The equipment, which is placed over the intake well, consists of two wooden mixing tanks mounted above two large solution tanks, from which the chemical flows through a flexible rubber pipe to a constant level feed tank and thence through a second length of flexible pipe to a manifold of pipe, through small holes in which the hypochlorite is discharged.

The charge of bleaching powder is first rubbed through the screens on top of the mixing tanks, and mixed with water into a thick paste; then the whole charge is dissolved by water from the supply pipes shown in the accompanying drawing, and the lower tanks allowed to fill with the solution of the required strength. Each solution tank has sufficient capacity for 24 hours' supply. The solution is made up in one tank, while the other is emptying into the water supply, and by the arrangement of piping shown, the tanks can be interchanged on the feed without interruption, thereby securing a continuous flow into the constant-level tank.


Water Sterilizing Apparatus.

From the solution tanks the hypochlorite flows through a 2-inch central valve and meter to a small, constant-level tank, suspended in the intake well. The function of this tank, which may be raised or lowered by means of the small crank shown in the drawing, is to regulate the head on the distributing grid, so that a proper quantity of the solution may be added in proportion to the pumpage. The solution tanks and distributing grid are connected by rubber hose. The solution in flowing into the raw water in the manner shown through small holes in the piping of the grid, is more or less uniformly distributed throughout the water entering by the intake pipe.

The quantity of water pumped at present is about 16,000,000 Imperial gallons in 24 hours, and about 120 pounds of bleaching powder per day is used. The strength of the solution in the large tanks is about 0.5 per cent. and 100 gallons per hour is fed to the supply; that is, the raw water is dosed with bleaching powder in the proportion of about 1 part in 1.3 millions of weight. The commercial product has an average of 37 per cent. available chlorine.

The plant was installed under the direction of Mr. J. O. Meadows, sanitary engineer of the Provincial Board of Health, by the Montreal Water & Power Company, of which Mr. F. H. Pitcher is general manager and chief engineer. It has been in successful operation since January 24th.

Labor Matters

About 100 carpenters of Kingston, Ont., went on strike last week for an agreement of $3 per day of 8 hours.

At Regina, Sask., between 200 and 300 men, belonging to the carpenters', plumbers' and electricians' unions, went out on a demand for increased wages. A large supply of non-union carpenters is reported at Regina and it is stated that nearly all the positions vacated by the union men are being filled. The contractors of that city agreed to the union scale of wages, but refused to recognize the closed shop.

At Halifax, N.S., the plumbers are out owing to the refusal of the master plumbers to grant an increase of from 25 to 30 cents per hour. The carpenters in this city have also asked for an increase.

At Toronto a strike has been declared by the painters, who want a minimum rate of 35 cents per hour instead of the 30-cent one which has hitherto prevailed. The Master Painters' Association hold strongly to the open shop principle. The workmen at a meeting held last week declared for closed shop. About 500 painters are affected.

The new city engineer of Medicine Hat is Mr. A. J. Grimmer, who was at one time city engineer of Fredericton, N.B., and later on the academical staff of the Manitoba University.

The Ottawa Plumbers' Union wants a new agreement with the Master Plumbers and is asking for shorter hours and an increased scale. The plumbers are now getting from 38 to 40 cents an hour and working 50 hours per week. The following scale is what they suggest: From July 1, 1910 to July 1, 1911, 43 cents per hour; from July 1, 1911, to July 1, 1912, 44 cents per hour, and from July 1, 1912 to July 1, 1913, 45 cents per hour.

Contract Work for Municipal Projects

Some of its Advantages over Day Labor—Suggestions Looking to Improvement in the Present Method of Awarding Contracts*

By Chas. R. Gow

From experience in the use of both classes of labor under discussion, I think I can safely say that inefficiency of labor is not peculiar to municipal work. We have it in contract work just as often as we have the same inefficient supervision and faulty system of control. And I suppose that the reason municipal work, as a rule, costs so much by the day labor method is due to the fact that the system has grown up with municipal administration, which has made it peculiarly conducive to inefficiency.

The rate of wages paid for foremen and superintendents in municipal and most government work is, as a rule, I think, less than is paid by the large contracting concerns doing the same work on the same scale, and that would mean, of course, that a much less efficient class of foremen would be carried by the cities than by the contractors. We have found from experience that some foremen are cheap at $10 a day, while others who might be willing to work at from $2.50 to $3 a day, would be very expensive. As an illustration, I once worked as superintendent of a large contracting concern in New York. They had previously done railroad work, and they were engaged at the time on the construction of one of the large subway sections there, and brought on a lot of these foremen to handle that work. And the first criticism I made after looking over the work was that they did not have a sufficient number of competent and experienced foremen. I was told to hire any foremen I knew who were suitable for the work, but when I mentioned the fact that we would probably have to pay $150 a month for such foremen as I had in mind, the president of the company threw up his hands. After considerable argument he finally agreed to allow me to engage two such men as I wanted at that salary. The first of these men who happened to appear on the work was put in the place of a $3 man. And his first act was to discharge six men out of the gang, and in his first day's work the result was an increase in output of 25 per cent. And this increase in output, as I remember it, represented a value of something like $35 to the contractor. That would illustrate in a way what I mean when I say that the high-priced foreman is oftentimes cheap in the end.

The cities, of course, establish a fixed rate for their foremen as a rule. There is no promotion by merit, and there are seldom any questions asked as to the ability of the foreman, provided he comes with the proper credentials from the civil service or other department. Of course, the average laborer will do no more work than he is required to do, whether he is working for the city or for a contractor. And unless he has competent supervision the results cannot be expected from him. The political aspect of city labor was pretty clearly dealt with by Mr. Eddy. Of course, its demoralizing effect is unquestioned. It was in order to correct the evils of political control that the civil service system was inaugurated, and yet to my mind that is even a greater evil as regards labor inefficiency than political control.

An Interesting Case in Point

When, some years ago, I was acting as superintendent for the Boston Transit Commission, in charge of their contract labor, we had some 600 men employed. That was on the original subway, doing some special work where it was adjacent to buildings, or in localities where it was feared the contractors might lead the commission into difficulties. We were obliged under the law to procure all the labor from the civil service list.

And the most difficult feature of the whole undertaking was to secure a gang of men that we could do anything with at all. The trouble seems to come in this way: The good men, the efficient men, are seldom out of work for any great length of time. The value of their services is well recognized by contractors, and as soon as they finish up one job they secure other work, if there is work being done. Consequently they don't take the trouble to register with the civil service commission and wait their turn before they are certified for employment. The majority of the men who do register with the civil service commission are men who can't find employment in any other way and simply look upon the city as a good asylum from which to obtain an easy living. The result, as we found it, was that if we wanted 25 men to start a piece of work, we would make requisition for 100, and out of that 100 probably 50 would appear with high standing collars and patent leather shoes, and some of them on crutches or otherwise disabled. And we would be expected to select from that crowd a gang of men to go down 25 or 30 feet below the surface of the ground to brace trenches and excavate in wet and difficult ground. I can readily understand where the city departments may be seriously handicapped on that account and where a really conscientious official would have serious difficulty in obtaining a gang of men that would be suitable for his needs.

The next evil that suggests itself to me is the influence of labor unions. The labor vote, of course, is of such consequence that it can't be ignored by political office-holders if they expect to continue in office. And the result is that labor councils have been allowed wide latitude in dictating the details of labor administration. It is one of the avowed principles of the labor unions at the present time to so regulate the output of men as to make positions for the largest number of men possible. And they consider it perfectly legitimate to so cut down the output of one man as to make room for a second one doing the same work. Of course, where this is allowed to prevail, as I believe it is largely in the city employ, it can't be expected that efficient service can be maintained.

Sentiment vs. Economy

Then there is the question of discharging men in the city employ. Now that they are under the protection of the civil service, it has become a matter of considerable difficulty for a foreman to get rid of an inefficient man. And I can readily see where all these things combined can tend to raise the price. The matter of employing citizen labor is very fine in sentiment, but it hardly makes for economy. The contractors found long ago that the available supply of English-speaking labor was practically exhausted, that is, the supply of competent labor. And they were obliged to turn to foreign labor, not so much as a matter of economy, as a matter of necessity. My own experience is that we pay practically the same rates of wages to the competent foreigners that we do to equally competent Irishmen or Americans. And while we would much prefer to have the English-speaking man to the foreigner, we find it impossible to obtain a sufficient number of cofpetent men. And, as a matter of fact, the Italian labor at the present time is becoming scarce. The better class of Italian laborers to-day can command and receive $2 a day, when business is good, for common labor. We pay some of them who are skilled a little beyond the average, as high as $3 a day. We pay a minimum wage in our company of 17.5 cents an hour, and an average for common labor of probably about $2.10, which is not a serious handicap to day labor as a matter of competition.

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*Extracted from an address given in a discussion before the Boston Society of Civil Engineers.

I am inclined to take issue with Mr. Eddy as to the possibility of day work being done better than contract work. My experience and observation led me to a different conclusion. I have noticed that where day labor is in vogue, as a rule there is no inspection, and where there is any conscientious endeavor to do the work cheaply, it is carried to the same extreme that a contractor is apt to carry his work in doing it cheaply. I have in mind an instance I noticed a few years ago in one of the cities nearby where bids were asked for the construction of a covered waterway, a brook channel, I think it was. And for some reason all the bids were rejected and the work was done by day labor. In that case there was an inspector on the work who appeared to me to be a little more ambitious to hustle the work along and to do it cheaply than even the foreman himself. Most of his energies were given to pushing the work. On that particular piece of work there was a concrete arch, very flat, as I remember it, and not more than 12 inches in thickness. And at the time I noticed the work they were concreting this arch and imbedding in it field stone as thick as they could get them and still have them come within the limits of the sections. Now, so far as I know, no serious trouble has occurred from that type of construction, but I rather imagine that if a contractor suggested that to an inspector or an engineer he would be told a few things. There are several other cases I have in mind where contracts have been called off and bids rejected and the work subsequently done by day labor, and the engineers or inspectors, having the contract price in mind as an upset price which they must not exceed, have stretched their consciences materially to keep within the limits under the disadvantageous conditions they were put to by the labor situation and expense.

Incompetent Tenderers and Low Bids

As a general thing, in letting contracts, the disadvantages could largely be overcome if the engineers would show a little more courage oftentimes in rejecting low bids and the bids of incompetent parties, and insist, as far as they were able to do so, on awarding the work to competent parties at what would be a fair and living price. We all of us make mistakes in our bids. We often overlook important items. You understand, of course, that the working engineer has had months, perhaps, to think over the problem and to think over the obstacles and the difficulties to be encountered, while the contractor is obliged to form his judgment in a few days, and oftentimes the best of contractors make serious mistakes in estimating the work, and consequently bid ridiculously low. Of course, there is a certain spirit among contractors as well as other business men that makes them feel like standing up and taking their medicine under such circumstances. And oftentimes they would appreciate a suggestion from the engineer that he would like to have them retire under the circumstances and allow him to award the contract to a higher bidder. It is not impossible to find out by a proper investigation just what the ability of the contractor is and whether the work in question is beyond the limit of his ability. It seems to me that it would be perfectly proper, and should almost be deemed necessary under the circumstances I have outlined, to advise the awarding of the bid to some other contractor. And if this were done in all cases I think that the difficulties that arise out of contract work in some cases could be largely overcome.

Toronto building permits for April amounted to $[illegible]. The total for the year to date is $[illegible].

Some Data on Water Purification from Poughkeepsie, N.Y.

From the 1909 report of the Board of Public Works of Poughkeepsie, N.Y., the following data have been obtained on the operation of the water purification plant. The highest recorded amounts of chlorine were 19 parts per million on Dec. 12, 1908. The general average has been 12 parts per million. The raw water is subject to considerable variations in turbidity and bacteria; the periods of low turbidity being in general coincident with periods of low bacteria. The maximum turbidity recorded was 400, on Feb. 25, 1909, the maximum bacterial count being 120,000, two days previous. The minimum turbidity was 12, on May 19, 1909, and the minimum bacterial count was 600, on July 6, 1909. The sedimentation basin provides storage for about 24 hours' flow on the average. The results of the study of silt in the basin was as follows:

Total number of gallons of water	914,552,299
Total volume of sludge, cubic yards	551
Total weight of sludge, tons	524
Total weight of dry material, tons	140
Per cent. of total deposit in ⅛	58.4
Per cent. of total deposit in ⅓	74.4
Per cent. of total deposit in ½	82.9
Cubic yards sludge per million gallons	0.6
Tons dry material per million gallons	153
Average turbidity raw water	37.2
Average turbidity settled water	18.7
Per cent. removed	49.7

The low per cent. removal probably on account of clear water during a great portion of the year.

Based on experience of 1908, the following coagulant table was prepared:

Turbidity	Grs. per gal.	Turbidity	Grs. per gal.
40	1.00	100	1.75
50	1.15	125	1.85
60	1.30	150	2.00
75	1.55	200	2.20

The turbidity was determined by the standard turbidity rod. The color by comparison with permanent "platinum cobalt" standards. The alkalinity according to standard methods, using lacmoid as an indicator. The chlorine was also determined by standard methods. Bacterial counts on gelatine at 20 degrees C., and again at 37 degrees, have been made daily throughout the year; the 20 degrees gelatine in duplicate.

The general averages of temperature, turbidity, color and alkalinity of the raw and settled waters for year ending Dec. 1, 1909, were as follows:

	Raw Water.	Settled Water.
Temperature	53.6	53.6
Turbidity P. P. M	35.4	16.3
Color P. P. M	49.4	38.6
Alkalinity P. P. M.	51.5	47.3

The general averages of turbidity and bacterial counts from Sept. 1, 1908, to Dec. 1, 1909, were as follows:

	Raw Water.	Settled Water.
20 degrees	9853	1569.
Per cent. rem.		[illegible]
37 degrees	[illegible]	[illegible]
Per cent. rem.		[illegible]
Turbidity	37.9	19.9
Per cent. rem.		[illegible]
Coag. grs. per gallon	1.224	....
Number days coag. used	12.7	
Free P. P. M.	..	0.46

Experiments with chlorine as a disinfectant were begun Feb. 1, 1908, and continued until the 12th, using the coagulating tank for the applying of the [illegible]. [illegible] tank was used to permit the use of the [illegible] disinfectant house could be built. The removal from the first to the twelfth was an average of 96.4 per cent. in the settled water, and in the same number of days previous the per cent. removal was 53.3. At the present time two large vats are used alternately with a capacity of 990 gallons each, with proper pipe connections and apparatus to carry the solution directly over the flow of water into the basin. The use of chlorine was continued during the summer months while the basin was out of service, by a laying a line of 1-inch pipe across the road into the small intake basin. Not the slightest trace of chlorine can be found after an 8-hour day now.

From Dec. 1, 1907, to May 1, 1909, 32 counts were made, in which the counts before cleaning were less than counts after cleaning, and six counts were greater before than after cleaning, the total number of counts being 38, a per cent. of 84.2, in which an increase was shown after cleaning. During the year filter No. 1 was scraped seven times; No. 2, six times; No. 3, six times, and No. 4, seven times. The following table gives data regarding average length of runs and millions of gallons of water filtered between scrapings:

	Filters.			
	1	2	3	4
Days elapsed	54.7	57.0	60.4	59.2
Days actual operation	51.9	54.1	58.5	56.3
Mill. of gals. per acre filtered	89.8	91.1	126.3	79.4
General average of days elapsed			57.8	
General average days operation			55.2	
General aver. mill. gallons per acre filtered			96.6	

The general average removal of dirty sand at each scraping has been, approximately:

	Filters.			
	1	2	3	4
Thickness removed (feet)	0.10	0.14	1.08	0.09
Cubic yards removed	54.5	77.0	41.0	42.0

No. 1 and No. 2 filters were re-sanded to make a depth of sand of 5.33 feet above the bottom of the pillars, 497.8 cubic yards being placed on No. 1, and 511 cubic yards on No. 2. No. 3 and No. 4 were re-sanded the year before. Four-inch cast iron water pipe was laid on top of filters used as a supply for the new sand-washing apparatus, which consists of an ejector, a distributing box and 200 feet of fire hose, with 8-inch pipe for waste. This apparatus is said to have greatly reduced the cost of re-sanding and is expected, with a few improvements, to effect a total saving of 40 per cent. The heaviest deposits of silt are at the effluent ends of all the filters. The policy has been followed of letting the filters with the lowest "co-efficient of conditions" deliver the most water.

The foregoing data on the operation of a slow sand filter plant are of value, but the cost items are omitted. In the portion of the report devoted to bookkeeping and financial statements the items are not given in sufficient detail to give satisfactory ideas of unit costs.

Experimental Grouted Macadam Road

During the past year a New York State Commission of Highways set aside $1,800 for an experimental piece of concrete road to be constructed according to ideas of the county engineer of Westchester county. The piece of work was constructed on Road No. 52 last July under the direction of Eberhard J. Wulff, county engineer, and the following matter has been taken from his report to the State Commission of Highways:

Crushed trap rock of a size usually employed in the top course of a macadam containing, by experiment, about 40 per cent. voids was spread on the old macadam surface and rolled by a steam roller to a finished thickness of about 3 inches, the percentage of void being reduced by this rolling to about 25.

Screened sand and Atlas Portland cement were mixed in the proportions of one part cement to three parts sand, in the dry state, on a mixing platform, spread upon the road surface and worked into the voids by sweeping about with brooms and continuous rolling with a steam roller until the voids were completely filled with the dry sand and cement mixture. Water was then spread freely on the road surface, forming a fluid grout of the sand, cement and water, the sweeping, watering and rolling being continued to assist a perfect penetration and filling of the voids between the adjoining particles of stone. More sand and cement mixture was spread wherever it was found necessary to completely fill all voids and to leave a very thin covering over the entire surface, which, when completed, was smooth and even but slightly gritty. The roadway was then permitted to harden for about seven days before being thrown open to traffic, the roadway being wet down frequently during that period. Expansion joints were placed about 25 feet apart by pouring a thin line of heated asphalt across the roadway after the broken stone was compacted but before any sand and cement mixture was spread. A section of 100 feet in length was placed without expansion joints but reinforcing the concrete slab with woven wire mesh.

The completed roadway, states the report, presents a smooth surface, equal to new macadam, is quite free from irregularities frequently formed in concrete roads, and offers a good foothold to horses. Automobiles have no detrimental effect on the road. After five months of fairly heavy traffic over the road no serious defects have developed and the coming winter will prove the efficiency or the advantage of expansion joints or reinforcement.

The measured quantities of materials used were 88 barrels of cement, about 40 cubic yards of sand, and 200 cubic yards of 1½-inch trap rock (commercial size), the resulting concrete representing a mass of 150 cubic yards in place. Expressed in the proportion of the completed concrete, the mixture would be about 1 : 3 : 7½; if expressed in the proportions of the loose materials used in the mixture, would be about 1 : 3 : 12½. It would be manifestly impossible to secure a dense mixture if the materials were mixed in the latter proportions in the loose state, and the resulting concrete would unquestionably be porous and full of cavities and lacking in resisting power for road purposes. The result of the dense concrete being obtained by the expediency of reducing the voids contained in the loose stone by rolling.

The cost of the improvement was very nearly $1 per square yard and was in excess of the preliminary estimate. This was largely due to the cost of labor and the cost of renting tools and machines, and should prove materially less if similar work is done on a larger scale. All sprinkling was done by hand sprinklers, as it was found impossible to use a sprinkling wagon. All sand and cement was mixed by hand, when a mechanical mixture would have been more economical.

The detailed cost of the work was as follows:

	Total.	Per sq. yd.
200 cubic yards trap rock, at $2.47	$ 493.20	$0.2774
88 barrels Portland cement	143.20	0.0805
50 cubic yards of sand	75.00	0.0422
1,600 square feet wire reinforcement	52.10	0.0292
2 barrels of asphalt	15.00	0.0080
Lumber	16.00	0.0090
Steam roller, 21 days	210.00	0.1182
Teaming	150.00	0.0856
Hire of tools and machinery	100.00	0.056
Labor	517.50	0.291
Total	$1,772.00	$0.996

Tar painting is now practised on most of the roads of the Walmer Urban District in England, according to Mr. R. H. Lapage, and has reduced the annual total cost of maintenance and repairs about 4½ cents a square yard on the main highways, as compared with the cost when tar was not used.

Trade News from Montreal

Labor Matters and Condition of Supply Market—Fair Wage Clause for City Contracts—Personal Notes

Montreal Office of the "Contract Record."
May 9th, 1910.

The past fortnight in Montreal has been a very important one to the building trades, in many respects. During this time a strike has been threatened and apparently averted.

The structural steel men were the interested parties and it is stated that outside influences were brought to bear upon the local union of steel workers to induce them to go out on strike. Apparently satisfied with existing conditions, this the Montreal men refused to do, and none of the structural companies have experienced any difficulties with their men. A strike at this season of the year, while it undoubtedly would prove a serious setback to all the larger building operations and cause unlimited hardships to all interested in construction work, yet the strikers would inevitably be the losers and have cause to regret their hasty actions.

Sub-contractors Dissatisfied

During the past week a persistent undercurrent of discontent has been noticeable among the various sub-contractors to the building trade, and to a large extent this is due to an investigation into the affairs of a Montreal general contractor whose balance of assets over liabilities is anything but promising to the interested parties.

The different trades feel that they are entitled in some measure to protection against losses of this kind. It is rumored, in fact, that the plumbers will take immediate action and will enact a regulation that will force contractors following their trade to notify the proprietors within eight days of the signing of their contract that they (the plumbers) must be protected against loss. This they are enabled to do under the Quebec laws.

Contractors would also like to see the names of the different sub-contractors announced when the general contract is signed. They object to these contracts going to contractors other than those who have figured the job and have thus been largely instrumental in obtaining the contract..

Undoubtedly the sub-contractors have had much to complain of in the past, and perhaps a solution of their troubles rests with the architect, who by his personal supervision can make the pathway of the various contractors a much easier one.

Conditions of the Supply Market

Cement continues to be an active feature of the supply market and is moving quite freely. From the office of the Canada Cement Company we learn that cement sales are far in advance of the same period in 1909.

Brick are quoted at prices unchanged from last year's figures, but are not yet in heavy demand. Almost every barge reaching Montreal at present has its quota of river brick. They are coming from Three Rivers, Sherbrooke, St. John and various points in the eastern townships, and there is very little prospect of a scarcity in this line during the coming summer.

Foundation Troubles

It is early yet for a rush in building supplies. Almost every contract of any size that has been commenced this season is struggling with foundation troubles. The Windsor station contractors finished their work some time ago. Now there is the addition to the General Hospital, the two schools for the Protestant school commissioners, the Y.M.C.A. foundation, and many others that could be mentioned, which are either giving or show promise of giving trouble with the foundation work.

"Fair Wage" Clause for City Contracts

The Montreal City Council have decided to insert a "fair wage" clause in all city contracts and are also considering the appointment of .a "fair wage" officer whose duties will be similar to those of the Federal Government's officer. The resolution as adopted by the City Council is as follows:

1. The contractor shall not have the right to dispose of his contract to another, and should he do so it will not in any way affect the conditions of the contract.
2. All workmen employed in the execution of the contract must be residents of Montreal unless in exceptional circumstances.
3. Undermentioned are the minimum wage and the maximum hours for the various trades. (These left blank.)
4. Any case not mentioned in this list will be fixed by the Board of Control, the rate of wage to be similar to the current wage in the city of Montreal.
5. The contractor may not alter the terms under which the workmen are engaged without the consent of the Board of Control and then he must give a sworn statement of the payment made and from time to time show that he has paid his men in full for their part in the fulfilling of the contract.
6. A weekly statement must be made to the Board of Control of the names of the workmen, the amount of wages paid and the balance due.
7. In case where the contractor fails to pay his men the city may pay the sum due and deduct it from the amount of the contractor's bill, and similarly in the case where the workmen are employed at a smaller rate than that mentioned in the schedule.
8. No piece work will be allowed.
9. The hours shall be similar to those observed in the city of Montreal.
10. Only in cases of urgency may the hours of employment be increased.
11. The same conditions will apply to the hiring of horses.
12. Should the Board of Control be dissatisfied they may examine the books of the contractor.
13. It is imperative that the list of the hours of work and of wages should be posted in a conspicuous place.
14. The Board of Control may appoint at any time a fair wage officer.
15. Any contract entered into by the contractor and a workman, by which the latter shall receive a smaller wage than that mentioned in the list, shall be null and void.
16. The city of Montreal must in all undertakings observe the terms of the list of proper wages in every detail.

Notice is given to workmen that any breach of the above list of wages and of hours is to be reported to the Board of Control, and any such report will be treated confidentially

Lachine Canal Open

Spring construction work on the Lachine Canal has been completed and water was again turned into the canal on May 1st. The bulk of the work which Engineer Lordly and his assistants have carried through this season has centred around the St. Gabriel locks at the foot of Seigneurs street. At this point the canal has been widened and the guide pier lengthened considerably. These improvements have been made to offset the difficulties which up-going vessels have had to contend with, due to heavy currents.

General Contractor in Difficulties

A meeting of the creditors of Thos. Wand, general contractor, 320 Laval avenue, was held on May 6th, at the office of the Dominion Mercantile Protective Assn., Ltd. The creditors present were content to give Mr. Wand a release if his estate shows at least 30 cents on the dollar. A balance of assets and liabilities will be struck and it is expected that a settlement will be effected on the above basis.

Montreal's Annexation Policy

The Quebec Legislature has granted Montreal the privilege of annexing the municipality of Rosemount, but that corporation's contract with Le Cie de Traveaux Municeaux, for sewer work, street construction and permanent sidewalks amounting to approximately [illegible], was annulled. Under its own supervision, however, the city must expend $861,000 on public works in Rosemount Ward during the ensuing three years. The proposal to annex Maisonneuve was vetoed by the Quebec Legislative Council. By its recent annexations the geographical area of Montreal has been practically doubled but its population has only been increased by about 25,000.

The Blumenthal Building

The contract for the erection of the new building on the Blumenthal Estate has finally been awarded to Messrs. D. G. Loomis & Sons, general contractors, who have commenced its construction. The structure will front 90 feet on St. Catherine street, and 120 feet on Balmoral street. It is to be built of reinforced concrete, fireproofed throughout, and will be faced with terra cotta. Messrs. David Ogilvy and C. A. Mitchell were the associated architects who drew the plans. The cost will be in the neighborhood of $200,000.

Paving Contractors and the City

City Surveyor Barlow has stated that no experimental paving materials will be tried out this year. They will not, however, prevent the laying of a sample block at the expense of the interested parties. Quite a large amount of work has been placed under way already by this department and is being done by day labor. Objection was taken to the insertion of the word "scoria" blocks in designating the material to be used, and this has since been changed to read "artificial blocks."

Prominence of School Buildings

A large percentage of the contracts let to date are for school buildings, and this class of structure is forming a very important feature of 1910 construction in Montreal. Almost every architect is drawing plans for a school building, and according to the latest report the largest of all will be built this year in Outremont for the Jesuits.

Personal Notes

Messrs. Ross & Greig, representatives in Montreal and district for the Goldie - McCulloch Company, Limited; Sheldon Company, Limited, Galt; Gurloch Packing Company, Hamilton; Spooners' Copperine, Port Hope, have removed from 325 to 412 St. James street, where they have secured much larger quarters.

Messrs. Finley & Spence, architects, are now occupying offices at 46 Beaver Hall Hill ,having removed from 74 Guardian Building. Their new apartments are handsomely designed and finished and do credit to this well known firm of architects. Mr. W. A. Gagnon, for some time employed with Messrs. Finley & Spence, has been made an associate member of the firm.

Mr. Eric Mann, who has been a resident of Montreal for a great many years, has given up his architectural practice and left for Scotland this week, where he will reside in the future.

Theo Daoust, architect, 103 St. Francois Xavier street, has removed to new and modern offices at 90 St. James street.

On or about the 20th of May, Messrs. Eadie-Dougles, Limited, will move to their new building, No. 12 University street, Montreal. This building has been entirely remodelled to suit the firm's requirements. The ground floor front is finished in Burmantofts' Marmo terra cotta. On the ground floor there is a large showroom and quarters for salesmen, and the upper two storeys will be divided up into various offices. The Terrano Flooring Company of Canada, Limited, the Insulyte Company, Limited, and the Dominion Fireproofing Company, Limited, will also have offices in the building.

At Vancouver, B.C., permits were issued last month to the value of $1,461,208. The total for April, 1909, was $783,490.

Trade Conditions at Winnipeg

With a prospect of the greatest building season ever experienced, Winnipeg has the misfortune to be suffering from a shortage of building materials that might almost be termed a famine. The present scarcity is greater than at any other time during the past six years. Common brick has advanced $4 a thousand, timber and dimension lumber are $2 higher than a week ago, and shingles are selling for almost whatever dealers dare to ask. Cement is still selling at 75 cents a barrel over last year's price, and the supply is very short. Good common brick is practically cleaned out, and all the local brick yards have disposed of their supplies. Contractors are estimating a hold-up of at least three weeks on big jobs.

There is not only a shortage of material but also one of labor. It is stated that contractors in the city last week who were desirous of getting 700 men for construction work in the west were unable to get more than one-fourth the number needed. Municipal work and railroad construction are hampered by a lack of men. The Winnipeg painters, of whom there are several hundred, have gone on strike for 40 cents an hour. They are at present receiving 30 cents. The employers have offered 35 cents, but will probably have to meet the demands of the men, the T. Eaton Company, the Hudson Bay Company and ten others firms having already done so.

Diamond Drilling, Quebec Bridge Site

Diamond drilling at the Quebec bridge site, which was begun in May, 1909, was completed in November, during which interval 19 holes were sunk, some on land, some at the shore line, some in shallow water and others in the bed of the river. All the work was done by the Sullivan Machinery Company, Chicago, and two crews were employed. For the shore borings platforms 20 feet high were built so that the drill was out of water at the highest tide levels. The river work was done from a scow and presented a number of difficult features: the current was rapid, the depth of water ranged from 30 to 48 feet, rough weather was rather frequent, and the tides caused a variation of 12 to 18 feet. In addition, the ground was troublesome, consisting of an irregular deposit of sand, gravel and boulders above the ledge or bed rock. For the deep water holes a 6-inch standpipe was driven through the drift deposit by a drive block sliding on the drill rod. This was followed by a 4½-inch casing below which a 2½-inch casing was driven to bed rock 50 to 130 feet below the river bottom. A large amount of blasting was required through the boulders. A 1⅛-inch core was removed, using a Sullivan Badger drill, and the ledge was drilled for a depth of 15 feet. The total length of holes was 2,000 feet.

A Progressive Firm

The American Road Machine Company of Canada, Limited, are now comfortably settled in their factory at Goderich, where they are manufacturing the well known "Champion" line of road making and contracting machinery.

The present firm are successors to the Canadian Road Machinery Company, of Hamilton, and were incorporated in December last. The president of the company is Mr. S. Jones Phillips, while the vice-president and treasurer is Mr. R. F. Mancill. The position of secretary and general sales manager is occupied by Mr. F. W. Woods.

Although operations in Goderich were started only in February of this year, a large number of new and up-to-date machines have already been turned out and the company find it necessary to keep their plant running day and night to keep up with their orders. The policy of the company will be to manufacture nothing but road and contracting machinery and to specialize on high class machines.

Empress Hotel, Victoria, B.C.

Among the many important projects of the kind which the C.P.R. is carrying out in western Canada this year is the extension of the Empress Hotel, Victoria, B.C., at an approximate cost of $135,000. The accompanying illustration, which is reproduced from a photograph kindly furnished the "Contract Record" by Mr. W. S. Painter, Montreal, the C.P.R. architect, will convey an idea of the nature of the proposed work. The addition to the hotel will be placed over the kitchen wing and will be constructed of steel and reinforced concrete. It will contain 67 bedrooms and 53 bathrooms. The floors throughout will be of concrete. Both the exterior and the interior of the proposed addition will be made to conform with the existing building. Contracts for the work have been awarded as follows: General contract, J. L. Skeene, Victoria, B.C.; plumbing fixtures, James Robertson Company, Montreal; hardware, James Walker Hardware Company, Montreal.

C.P.R. Empress Hotel, Victoria, B.C., which is to be Enlarged at a Cost of $135,000

Personal News and Notes

Mr. Angus Smith, the new city engineer of Victoria, B.C., will probably have control over all construction work in the waterworks department. Hitherto the Water Commissioner has been in charge of the work and there has been a considerable amount of disagreement.

Mr. L. Yaeck, of Walkerton, Ont., has discoveerd good clay at Merritt, B.C., where he will shortly establish a brick yard.

The city council of Port Arthur, Ont., have placed Mr. J. A. Antonisen, city engineer, in charge of all public utilities in that city.

The Calgary city hall has been in an uncompleted state for nearly two years. It is estimated that the sum of $125,000 will be required before it is ready for occupation.

Congratulations to Mr. M. P. Davis, Toronto, the contractor for the sub-structure of the new Quebec bridge. Mr. Davis survived the ordeal of a marriage ceremony last week.

Mr. W. A. Bowden, who for the last five years has been designing engineer for the Department of Railways and Canals, has been appointed Chief Engineer of the Department. He is a graduate of McGill University.

During the month of April building permits were issued at Montreal to the number of 346, and to the value of $1,647,295. This is an increase of over $600,000 on the total for the corresponding month of last year, which was $1,016,856.

A dinner was held on the 20th ult., at the Prince George Hotel, Toronto, in honor of Mr. T. S. Scott, the assistant city engineer, who left the following day for Vancouver, where he will enter the contracting business. Dean Galbraith presided.

Mr. Allen Hazen, New York City, the consulting engineer who designed the Toronto filtration plant, has been called in by the city of Ottawa, Ont. While making his observations Mr. Hazen will be remunerated at the rate of $100 a day with travelling expenses and assistants' wages also paid.

Toronto labor men are indignant over a little accident that happened the other day to Mr. Alex Lyons, formerly vice-president of the Amalgamated Carpenters' Union of that city. Mr. Lyons left Toronto during the winter to visit the old country. Upon his return to New York he "did not happen to have the necessary amount of money in his pocket at the time he landed" and in consequence was hauled off to Ellis Island and detained there for a considerable time.

An Energetic "Trouble Man"

Mr. R. E. Holliday, of the Canada Cement Company, who was recently appointed testing engineer or "trouble man" for that concern, is a native of England and was educated at Oxford University. He has been in Canada seven years and consequently is pretty well acclimatised. Mr. Holliday possesses an expert knowledge of materials and has had considerable experience in construction. He was formerly secretary of the Provincial Construction Company, the concern which erected the Andrew Darling reinforced concrete warehouse at Toronto, a structure that is regarded as a particularly good example of this kind of work. Later on Mr. Holliday was associated with the Lehigh Portland Cement Company. For some little time Mr. Holliday had an office in the Temple Building, Toronto, but his headquarters are now at Montreal.

Mr. R. E. Holliday, Canada Cement Company, Limited

Lighting Problems and their Solution

Of the many problems that require complete solution in the design of a satisfactory home, few are of more vital importance than the question of lighting. The architect who is abreast of the times will be the first to admit the truth of this assertion and to welcome propositions dealing with artificial illumination that have real claim to merit. Within the past few years, electricity, without question the safest, most efficient and hygenic form of lighting—has been brought within easy reach of the general public by the invention of the tungsten lamp, which not only increases the degree of luminosity, but reduces the cost for current by over one-half of the charges usually made. A great many architects, however, have condemned the tungsten lamp owing to the frailness of the filament, but this, investigation has proved, is not the cause of any dissatisfaction, as where properly installed, this lamp is giving better satisfaction than any other illuminate upon the market to-day. Where the trouble lies is in the fact that the installation has been made without due consideration being given as regards proper protection for the lamp to offset any vibratory movement. When the Wels-

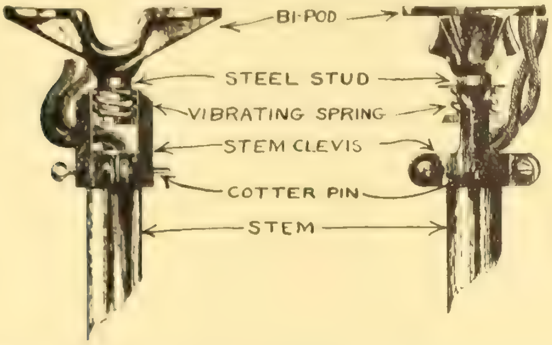

Figure 1. Showing the Anti-Vibratory Device on all stem type Folding Tungstoliers and Method of Fastening them to Ceilings

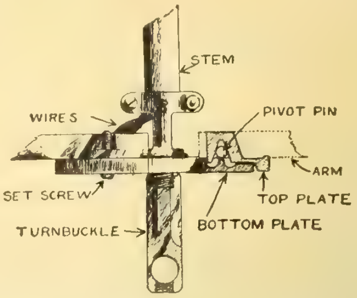

Figure 2. Method of Fastening Arms in both Stem and Close Ceiling Types, by the use of two iron plates

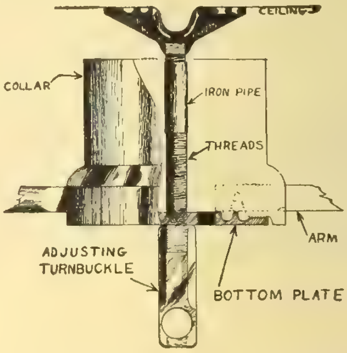

Figure 3. Showing close ceiling type adjustment

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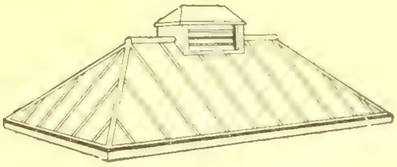

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bach burner was put on the market, the first step of the manufacturer of this ingenious light, was to instruct the general public that a jar or vibratory action was injurious to the mantle, and that any heavy movement would be disastrous to such a light. The tungsten lamp is in a measure likewise affected, although it is not to be inferred from this that it is as frail as the Welsbach burner in this respect. It is maintained, however, that if the tungsten lamp is properly protected from vibration and jar, the results will be far better than where they are simply used at an angle or in a rigid fixture. Realizing this, certain manufacturers have made a thorough study of tungsten (Madza) method of lighting, and have designed special anti-vibratory features to be used with lamps of this especial character. The accompanying cuts demonstrating the principle and illustrating the parts of an ingenious fixture designed for this purpose, will give architects an excellent idea of what constitutes a proper installation where the tungsten lamp is considered. These illustrations are reproduced from Bulletin No. 20, of the Tungstolier Company of Canada, Limited, Toronto, and they reflect in no little measure, the accomplishment of this firm in reducing this effective system of lighting to a most substantial and economical basis.

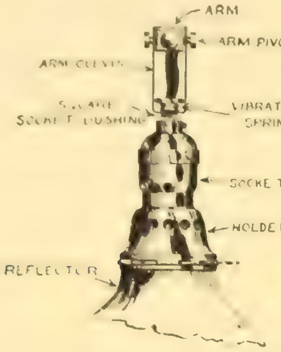

Figure No. 4. Illustrating method of providing an Anti-Vibratory Device in close ceiling types, protecting each lamp individually

It is not claimed, nor is it to be understood, that the tungsten lamp will not burn on an angle or in a rigid fixture, but it is quite plain that such a lamp when protected from jar and vibration, will last much longer, give better service and hence reduce cost of renewal to the consumer, than one which has not been properly considered in this respect.

A New Industry for Ontario

Mr. H. W. Calkins, who has just resigned as manager of the Imperial Plaster Co., has discovered a white gypsum rock in the township of Haldimand from which is made a plaster of paris equal to that which is turned out in New Brunswick. All the plaster of paris used in Ontario comes from New Brunswick, a distance of over 1,000 miles, and as Haldimand township is near the centre of Ontario and only 75 miles from Toronto, the freight rates to points in Ontario will be only one-quarter of the rates from New Brunswick, which will enable that district to virtually control the plaster of paris trade in Ontario. Mr. Calkins is organizing a company to operate the gypsum mine and will make, in addition to the plaster of paris, hard wall plaster, wood fibre plaster, finishers, etc. The company will also erect a hydrated lime plant. upon request.

Mr. Angus Smith, the new city engineer of Victoria, B.C., is studying the dust problem as it presents itself in that city. It is anticipated that some experiments will be made with crude oil, which has been used with great success in a number of the cities in California and other points on the coast.

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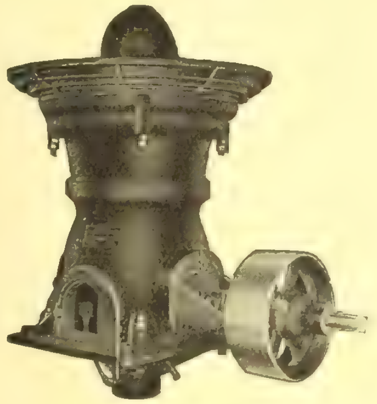

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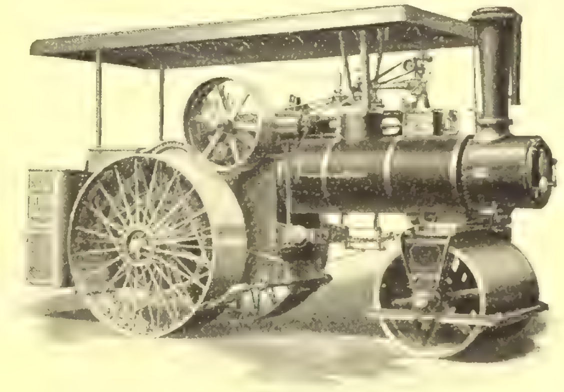

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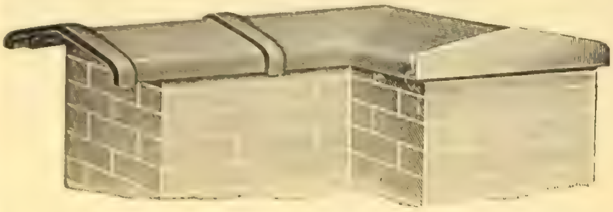

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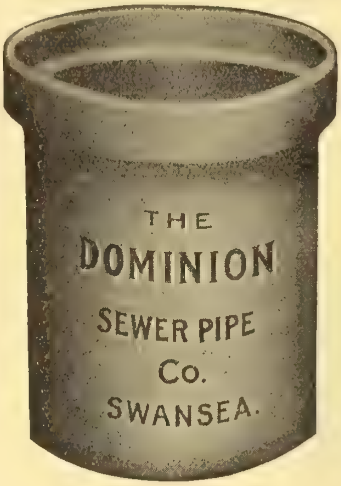

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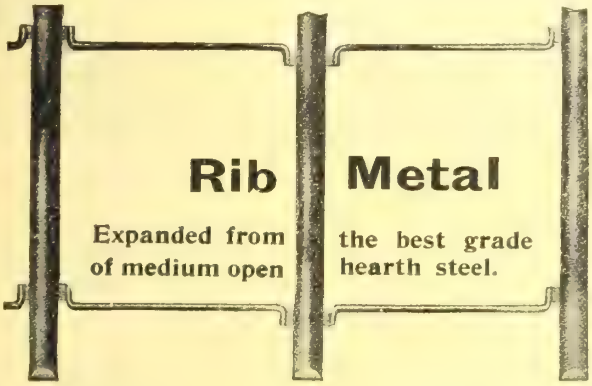
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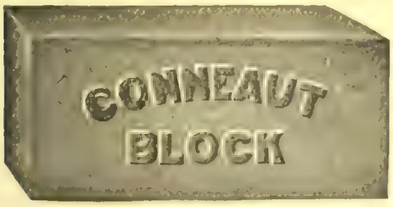

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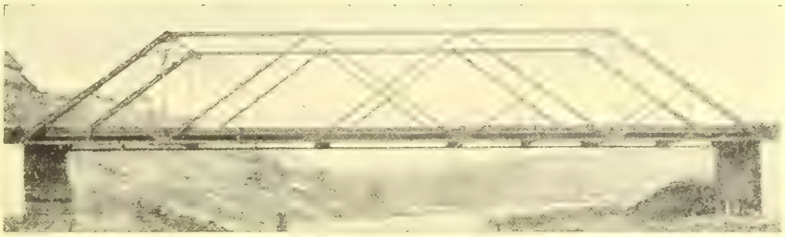

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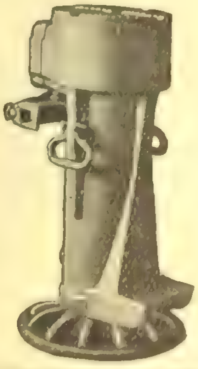

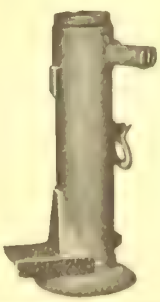

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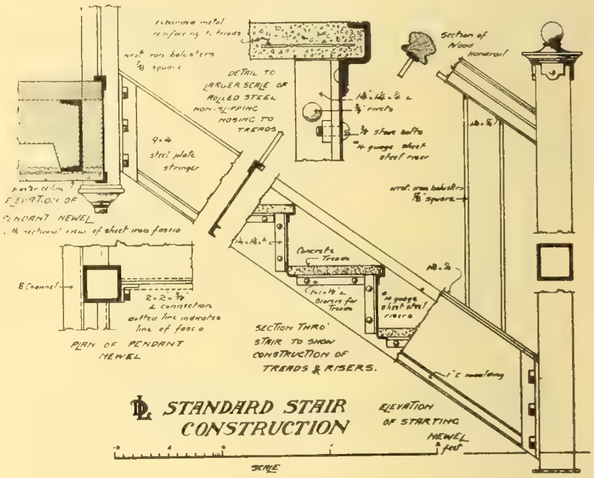
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dotted line indicates line of fascia
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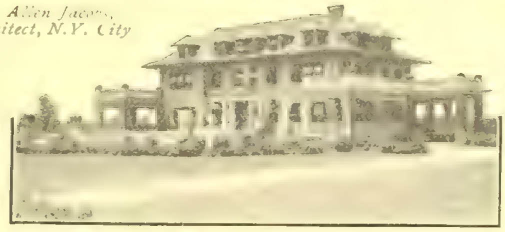

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For laying of Concrete walks I have seen nothing to equal it. It is simple in design, operated and adjusted easily and the running expenses are very little.

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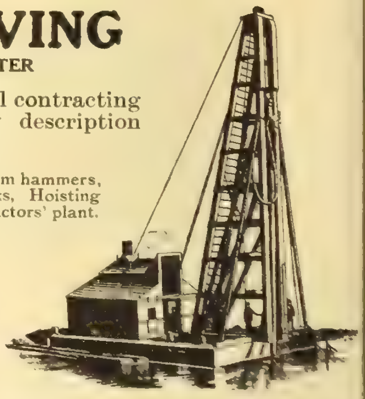

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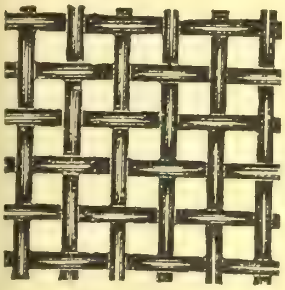

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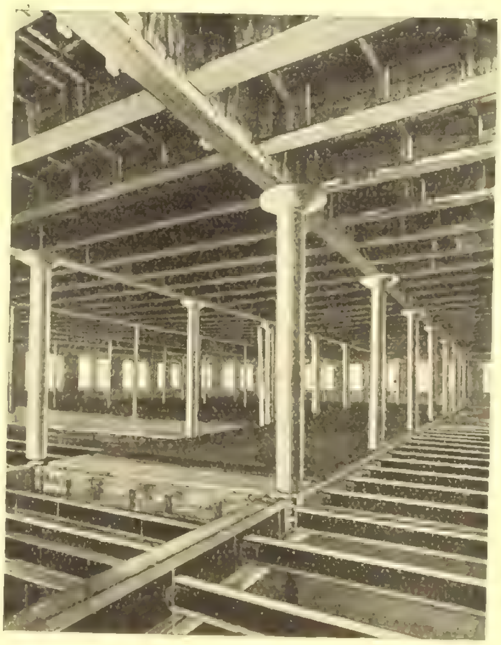

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Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	10.00
Grey stock bricks	10.00
Wire cut bricks, or foundation work	10.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D,D.
10 to 25 united inches	$4.25	$ 6,25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i,	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	.,..	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Prices f.o.b. Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex. and 3-16-inch round, 35 cents per square foot up.
Floor Tile—½-inch square 45 cents.
Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 25 cents per square foot.
Vitreous Tile—All sizes, according to color, 30 cents to 40 cents.
Glazed—White, firsts, 6 x 3 inches, 33 cents per square foot.
Matt—Dull finish colors, firsts 50 cents.
Capping Coves and corners, from 3 cents to 20 cents each.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 55 cents.
O. G, Cap, 6 x 1½ inches, 10 cents each.
Cove base, 6 x 3 inches, 17 cents each.
Bead Tiles, sizes from 1 3-16 x 6 inches to 6⅞ x 6 inches, 6 cents to 33 cents.
Cove tiles, size 1 5-16 x 6 inches to 4¼ x 6 inches, 8 cents to 28 cents.
White glass wall tile, 6 x 3 inches size, 18 cents; 6 x 2 inches size, 20 cents.
White glass, installed, 6 x 3 inches, 28 cents.
White glass, installed, 6 x 2 inches, 30 cents.

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Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Furnaces 45 per cent.; registers 70 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.; other specials, 40 per cent.

Boilers—Galvanized Iron Range,

30-gallon, standard, $4.75; extra heavy, $7.00.

CastIron Sinks.

16 x 24, $1.00; 18 x 30. $1.15; 18 x 36, $1.95.

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Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

7 and 8-inch pipe, 40 per cent.

Light pipe 60 and 10 per cent.; fittings, 70, 50 and 10 per cent.

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Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b, Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto.
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3,50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per thousand.
Steel channels and beams, $2.75 per 100 pounds, delivered, f.o.b. Toronto.
Lime, per cwt., delivered, 38 cents,
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plasters, $5.50 per ton.

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(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $7.50 to $8.00 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs,
Boiled Linseed Oil, in barrels, 85 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 82 cents per gallon of 9 lbs.
Turpentine, in barrels, 82 cents per gallon of 8 4-10 lbs.
Pure Linseed Oil Putty, 25-lb. tins, $3.50 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.00 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Byers & Anglin, contractors, Montreal, Que., have dissolved.

Pelletier, [illegible] & Company, electricians, Montreal, have dissolved.

Drapeau & Leblanc, painters, Lachine, Que., are stated to have dissolved.

F. M. Pope & Son, lumber merchants, Bury, Que., registered. F. M. Pope and Osborne L. Pope.

H. A. Clemens Company, Limited, [illegible], Ont., lumber merchants, are stated to have assigned.

Demers & Giradin, general contractors, Montreal, Que. Adrien, Demers & Victor Giradin have registered.

The B. C. Gazette gives notice of the incorporation of the following companies:—M. P. Cotton Company, Limited, capital $100,000, incorporated to carry on business as contractors, builders, dealers in brick, timber and other building requisites.

QUEEN CITY FOUNDRY Co., LTD.
Job, Machinery and Builders Castings
Heavy and Constructional Hardware.
Iron Castings of all kinds.
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Phone Main 7692 Toronto, Ont.

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SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
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Head Office: INGERSOLL, ONT.

THE COMMERCIAL
Established 1882
The Weekly Financial, Commercial & General Trade Newspaper of the Great West.
Winnipeg, Manitoba

The
Laurentian Granite Co.
Limited
MANUFACTURERS OF
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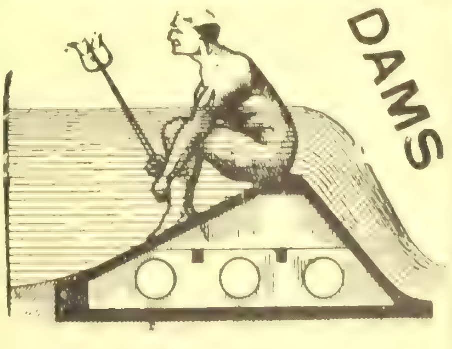

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Hydraulic Construction Co. of Canada, Limited.
405 Dorchester St. W. - MONTREAL P.Q

The "MODEL" with rubber glass.

MODEL COAL CHUTE

These cuts show the Coal Chute both open and closed. This is the new way to equip a house so as to do away with the annoyance of broken windows and disfigured window frames.

The door when open protects the wall above the chute, and when closed locks automatically, and is positively burglar proof.

The "MODEL" is supplied with rubber glass so that light can be admitted to the basement.

Made in three sizes. **Send for our descriptive booklet.**

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Maple Flooring

Perfect mill work and excellent grades
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Prices right. Let us quote you.

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This is the mark of the Underwood — more extensively used in Canada than all other makes of typewriters combined. No matter what machine you have used, or are using, you will ultimately buy the Underwood.

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Hard Laurentian

Birch Flooring

Perfectly Seasoned and kiln dried.
Tongue and groove. Hollow backed.
Bored and Bundled.

Manufactured by

The Standard Mills, Limited
55 St. Francois Xavier St., MONTREAL
Write for particulars and samples

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WIRE ROPE

The Greening Catalog No. 1. contains some very valuable information about the use and care of Wire Rope. Write for a copy.

We make all kinds and sizes of Wire Rope for every conceivable purpose. Our plant is the oldest and best equipped in Canada. We carry large stocks of all standard grades and sizes and can ship on receipt of order.

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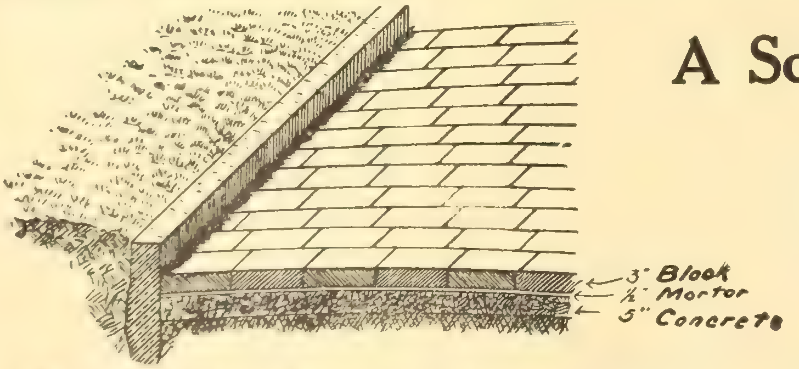

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must be

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Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These Requirements are Met by

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Send for Descriptive Literature

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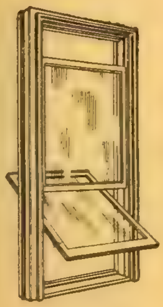

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Be Sure Your Window has an Underwriter Label

It is easier to prevent a disastrous fire than it is to stop one.

The weak point in all buildings is through the windows.

These openings can be made fireproof as the walls themselves by installing the **Douglas Fireproof Window.**

Printed matter, descriptive and illustrative, on request.

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LIMITED
Toronto, Ont. Montreal, Que.

Gang Saws!

See the

"Alston"

The **Saw** that **cuts** down **cost** as well as **Stone.**
Greater cutting capacity with less power than any other Gang on the market.

If interested, drop me a line

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ALL SIZES

For Steam, Gas, Oil and Water

Standard Flanged Fittings

Flanged Elbow

Reducing Flanged Tee
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For 125 or 250 pounds working pressure.

The only factory in Canada devoted exclusively to Cast Iron Fittings.

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Standard Fitting & Valve Co.
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GUELPH - ONTARIO

We Manufacture

Frames - Sash - Doors

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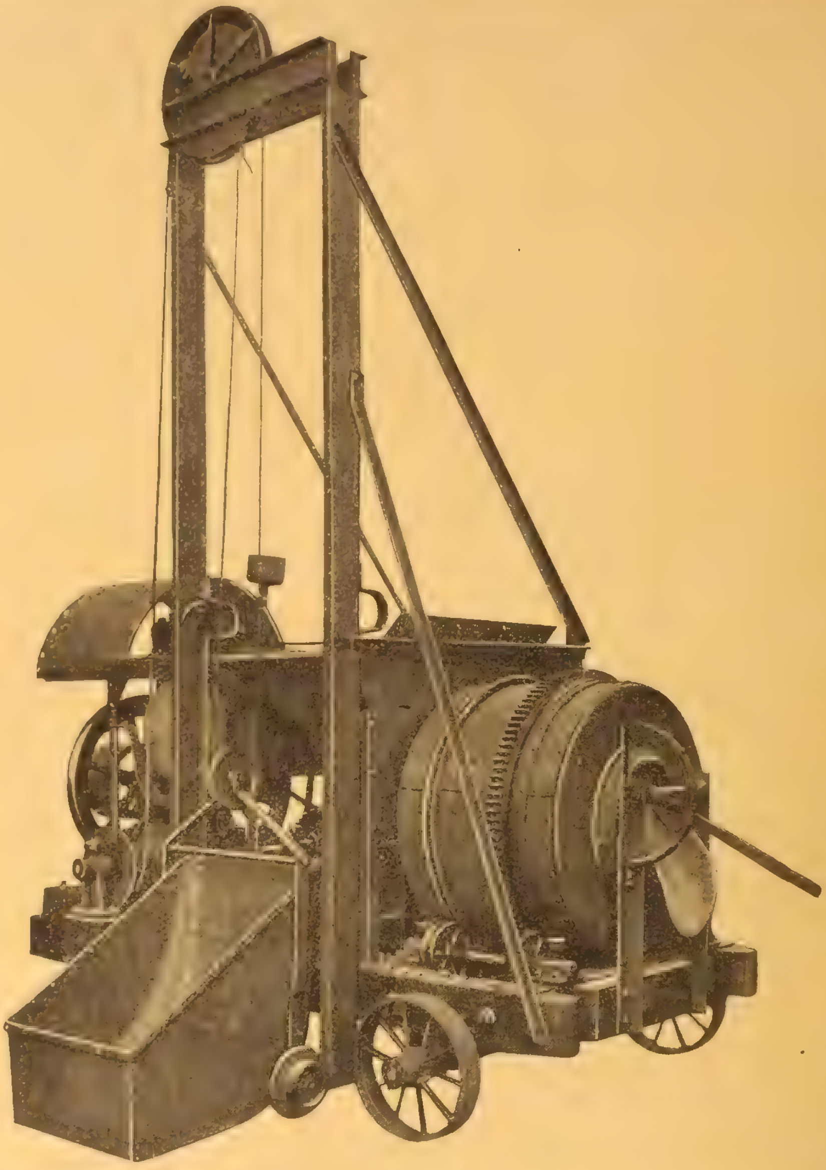
Finest Quality Hardwood Flooring High Class Interior Work

Our Arguments for soliciting your business are excellent

New and up-to-date Lumber Dry Kilns, of 200,000 ft. capacity. New and well equipped factory with latest and best machinery. Experienced workmen under the most expert supervision. :: ::

Give us a trial order
Our work will convince you

Georgian Bay Shook Mills
Limited
Midland, Ontario



Ransome Street Concrete Mixer

The above cut illustrates our Street Concrete Mixer, designed especially for handling concrete quickly and efficiently. Three batches of materials are handled at the same time, but independently of one another. No delay whatever, a continuous stream of concrete is discharged, but each batch is mixed separately. No poor concrete—every particle well mixed.

Four of these mixers are being used by Messrs. Laurin & Leitch, Contractors, Montreal.

Let us send you free particulars and prices.

F. H. Hopkins & Co.

Successors Late James Cooper

MONTREAL

Ritchie Contractors Supply Co., Quebec **Dunn Bros., Winnipeg** **E. A. Earle & Co., Vancouver**

Vol. 24 Toronto, May 18, 1910 No. 20

Contract Record

ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

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Manufacturers of the well-known

**TRIDENT
Frost-Proof
Water
Meters**

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Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited

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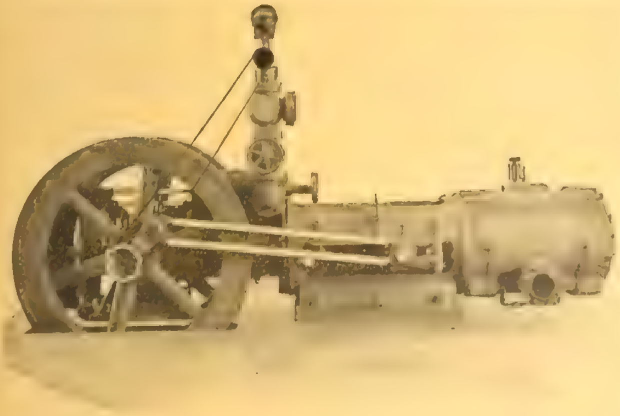

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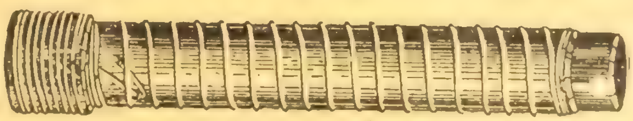

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WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.

One-half the cost of Iron Pipe—and better.

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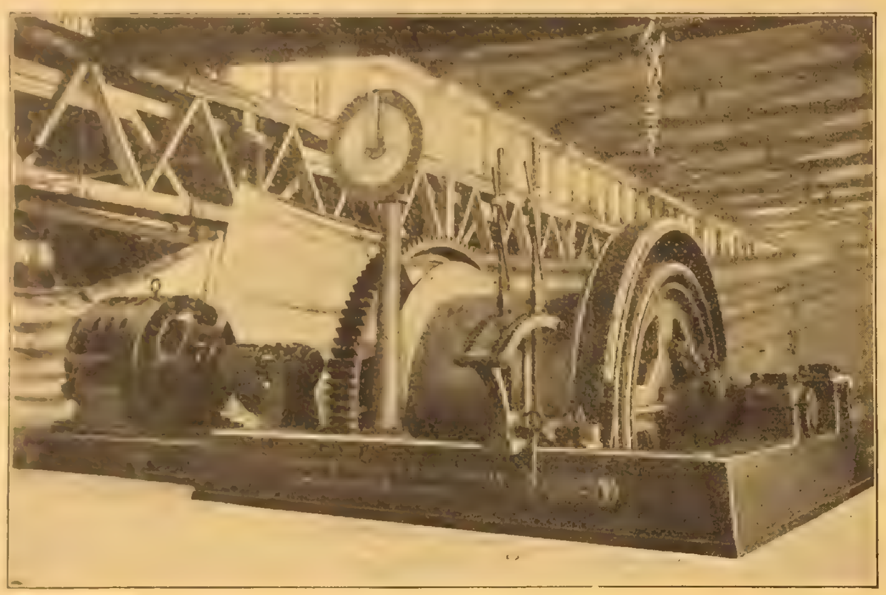

Our latest Improved Type of

Electrical Hoist

with Silent Chain Drive

Simple in design, neat in appearance, and durable in service.

If interested write for further particulars

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General Office: Sherbrooke, Que.

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$20,000,000.00!

The "Rockwood" Approved by all Canadian and American Insurance Associations

Canada's Annual Fire Loss. What Proportion Do You Pay?

Protect your Factory, Mill, Warehouse, Store, with

Automatic Sprinklers

Save 50 to 80% on Insurance Premiums

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Canada Cement Company

Limited

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Plants :—Durham, Ont.
Hanover, Ont.
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Prompt Service. - - - - Splendid Railway Facilities.

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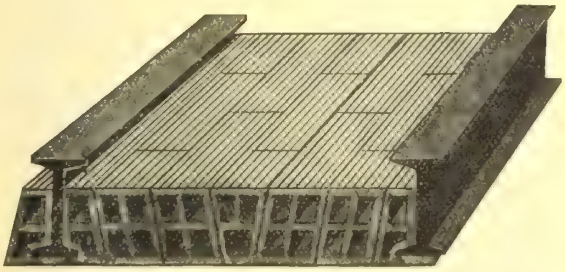
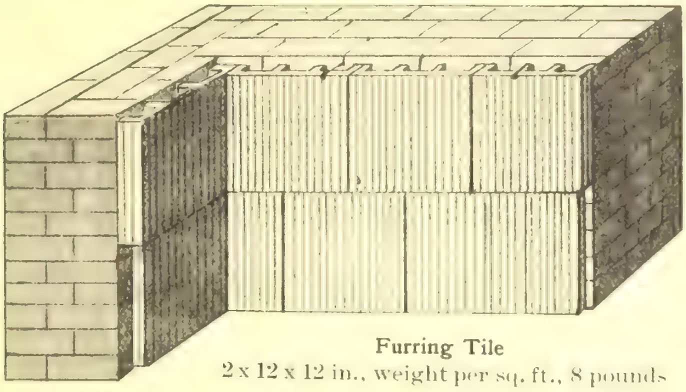
and Porous Terra Cotta Fireproofing



Perspective of Typical Arch



Furring Tile
2 x 12 x 12 in., weight per sq. ft., 8 pounds

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Head Office: 36 Toronto St., TORONTO
Montreal Agent: David McGill, 206 Merchants Bank Chambers

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Best for the Architect — Because he always wishes to give his clients the most substantial and most trustworthy material at the lowest ultimate cost.

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Best for the Underwriters — Because Inspectors can insist that imperfectly working doors be corrected in their presence.

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Specify and Insist on Ormsby's "Underwriters" Doors fitted with Adjustable Hangers.

Manufactured by
A. B. ORMSBY, Limited
Factories
TORONTO and WINNIPEG
Experts in Fireproof Windows and Doors

"HAGERSVILLE"
CRUSHED STONE
FOR
CONCRETE AND MACADAM

The Toughest Stone for Macadam in Ontario.

Offices and Quarries: HAGERSVILLE, ONT.

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Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

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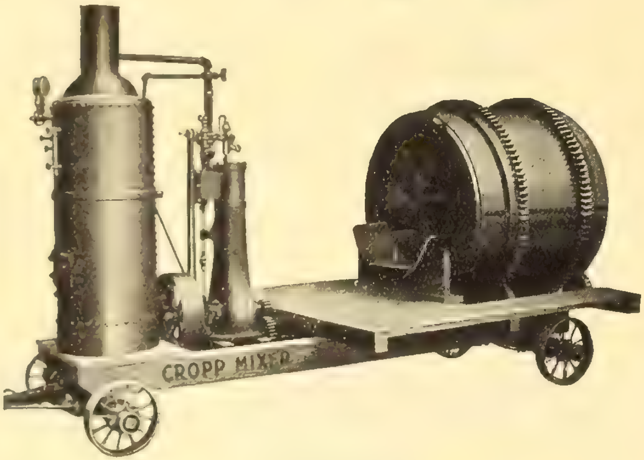
Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

We are bringing out a small Mixer number "O" which holds a One, Two and Four mix. This Mixer is very light and portable—just the thing for small Contractors.

Our Prices Will Interest You

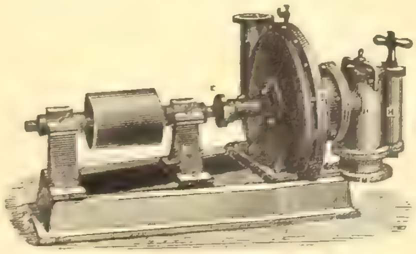
The only Mixer that will not spill when overcharged

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

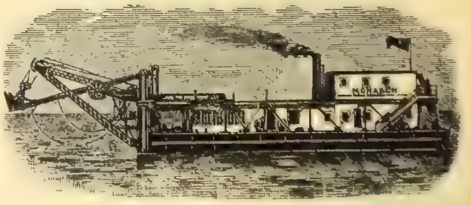
M. Beatty & Sons, Limited Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

Steel Dump and Deck Scows



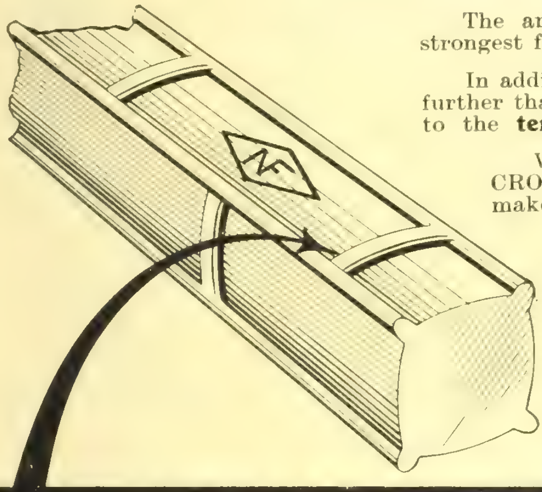
Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



It Adds to Strength and Lessens Strain

Here is a cut of a section of the

"NF" Reinforcing Bar for Concrete



The arrow points out the **longitudinal rib** which is one of its very strongest features.

In addition to the usual advantages claimed for deformed bars, we claim further that the **longitudinal ribs** on the four corners of the (NF) Bar add to the **tensile strength** and prevent **torsional strains** in the concrete.

We have proven this to be an established FACT. In addition the CROSS RIBS form a mechanical bond, so that less metal is required to make a PROVEN BOND under OURS than under any other system.

Does this mean anything else than a SAVING in COST, not only in the **first instance** but so long as the **building will stand?** Is it possible to figure the case out in any other way?

We should like to send you some literature on this point, may we?

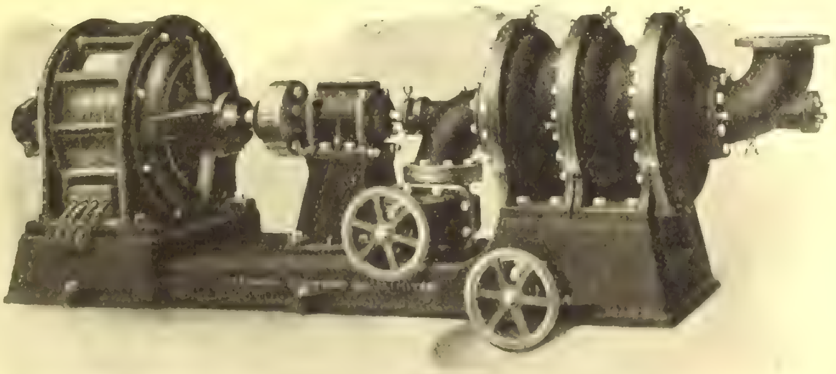
ONTARIO IRON & STEEL CO LIMITED TORONTO CAN.

Motor Driven Turbine Pumps

Simple

Reliable

Efficient



Made for

any

Service

These pumping units are especially adapted for municipalities desiring to utilize electric power for waterworks service.

CANADA FOUNDRY COMPANY, Limited

Head Office, TORONTO, Ont.

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Triangle Mesh Concrete Reinforcement

Continuous Bond—no Tying or Lapping Necessary. Made of Cold Drawn Mild Steel, Tensile Strength 90,000 lbs. per square inch, Elastic Limit 50,000 lbs. per square inch

---

LONGITUDINALS SPACED 4-INCH CENTERS.
CROSS WIRES SPACED 4-INCH CENTERS.

Number and Gauge of Wires, Areas Per Foot Width and Weights Per 100 Square Feet.

Styles Marked * Usually Carried in Stock

Style Number	No. of Wires Each Long	Gauge of Wire Each Long	Gauge of Cross Wires	Sectional Area Long. Sq. In	Sectional Area Cross Wires	Cross Sectional Area per Ft. Width	Approximate Weight per 100 Sq. Ft.
* 4	1	6	14	.087	.025	.102	43
5	1	8	14	.062	.025	.077	34
6	1	10	14	.043	.025	.058	27
* 7	1	12	14	.026	.025	.041	21
*23	1	¼"	12½	.147	.038	.170	72
24	1	4	12½	.119	.038	.142	62
25	1	5	12½	.101	.038	.124	55
*26	1	6	12½	.087	.038	.110	50
*27	1	8	12½	.062	.038	.085	41
28	1	10	12½	.043	.038	.066	34
29	1	12	12½	.026	.038	.049	28
31	2	4	12½	.238	.038	.261	106
32	2	5	12½	.202	.038	.225	92
33	2	6	12½	.174	.038	.196	82
34	2	8	12½	.124	.038	.146	63
35	2	10	12½	.086	.038	.109	50
36	2	12	12½	.052	038	.075	37
*38	3	4	12½	.358	.038	.380	151
39	3	5	12½	.303	.038	.325	130
40	3	6	12½	.260	.038	.283	114
41	3	8	12½	.185	.038	.208	87
*42	3	10	12½	.129	.038	.151	66
43	3	12	12½	.078	.038	.101	47

Special Sizes on Application

LENGTH OF ROLLS: 150-ft., 300-ft. and 600-ft.

WIDTHS: 18-in., 22-in., 30-in., 34-in., 42-in., 46-in., 50-in., 54-in. and 58-in.

LONGITUDINAL SPACED 4-INCH CENTERS
CROSS WIRES SPACED 2-INCH CENTERS.

Number and Gauge of Wires, Areas Per Foot Width and Weights Per 100 Square Feet.

Styles Marked * Usually Carried in Stock

Style Number	No. of Wires Each Long.	Gauge of Wire Each Long.	Gange of Cross Wires.	Sectional Area Long. Sq. In.	Sectional Area Cross Wires. Sq. In.	Cross Sectional Area per Ft. Width.	Approximate Weight per 100 Sq. Ft.
4-A	1	6	14	.087	.050	.102	53
5-A	1	8	14	.062	.050	.077	44
6-A	1	10	14	.043	.050	.058	37
* 7-A	1	12	14	.026	.050	.041	31
23-A	1	¼"	12½	.147	.076	.170	86
24-A	1	4	12½	.119	.076	.142	76
25-A	1	5	12½	.101	.076	.124	70
26-A	1	6	12½	.087	.076	.110	64
27-A	1	8	12½	.062	.076	.085	55
*28-A	1	10	12½	.043	.076	.066	48
29-A	1	12	12½	.026	.076	.049	42
31-A	2	4	12½	.238	.076	.261	120
32-A	2	5	12½	.202	.076	.225	107
33-A	2	6	12½	.174	.076	.196	97
34-A	2	8	12½	.124	.076	.146	78
35-A	2	10	12½	.086	.076	.109	64
36-A	2	12	12½	.052	.076	.075	52
38-A	3	4	12½	.358	.076	.380	165
39-A	3	5	12½	.303	.076	.325	145
40-A	3	6	12½	.260	.076	.283	129
41-A	3	8	12½	.185	.076	.208	101
42-A	3	10	12½	.129	.076	151	81
43-A	3	12	12½	.078	.076	.101	62

Special Sizes on Application

LENGTH OF ROLLS: 150-ft., 300-ft. and 600-ft.

WIDTHS: 18-in., 22-in., 26-in., 30-in., 34-in., 38-in., 42-in., 46-in., 50-in., 54-in. and 58-in.

Large Stocks carried for Immediate Shipment

W. D. Beath & Son, Limited

Toronto - Canada

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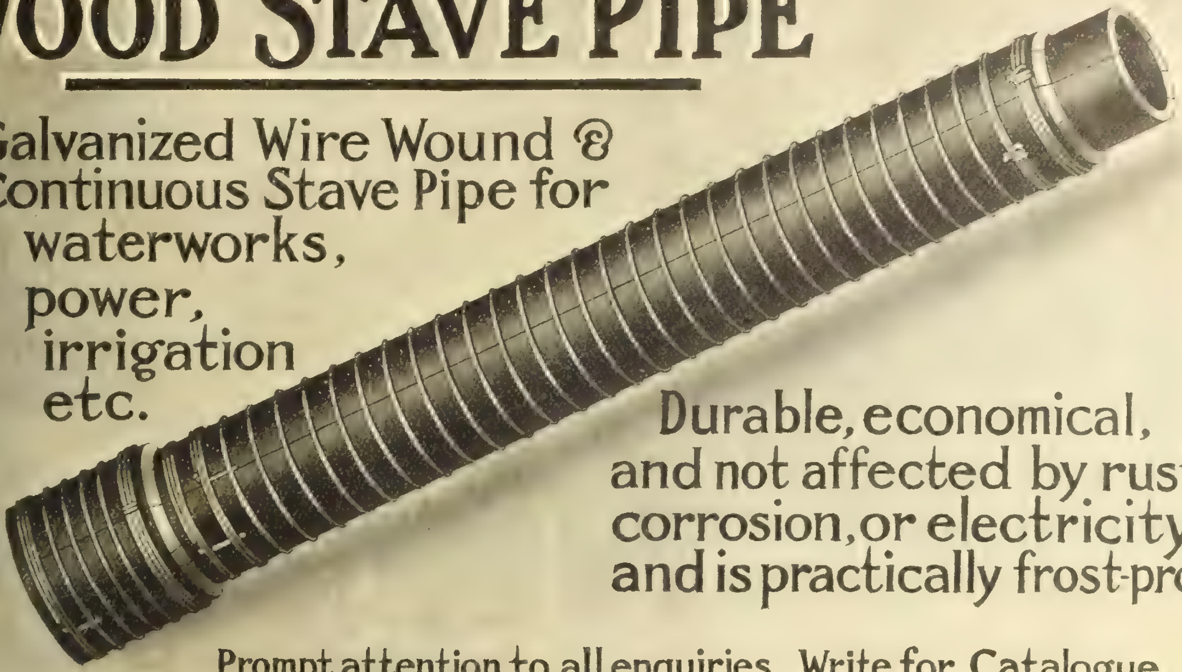
Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

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GOULD SHAPLEY & MUIR CO LIMITED BRANTFORD CANADA

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"MIMICO" Pipe Makes the Sewer Sure

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Extra Special Flexible Steel Wire Ropes

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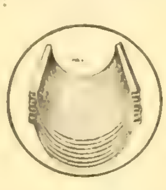
saves farmers money lowers taxes—betters roads

THESE culverts of mine are a great thing for the farming world. They not only make good roads possible, but they serve the farmer in many other ways. And they are so simply laid. They come nested like this:



This compactness saves freight and makes it easy to handle them. You put the sections together like this:

Then you clamp the flanges together like this:

And you've got a piping that will outlast anything of the kind there is. Better get the book and sample and study it.

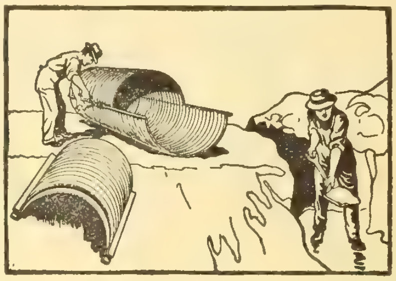
G. H. Pedlar

GET your township reeve or warden to study Pedlar Culverts. Send for the Free Book and show him why this Culvert surpasses for all ditch drainage, for restraining small streams, for every use that any culvert can serve. You will profit through lowered taxes, better roads and abolished washouts. Send for the book and interest your township's officials. You will benefit by what they will learn.

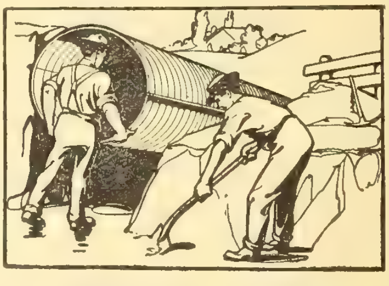
For a very moderate cost you can instal a perfect sewage-disposal system on your farm, using a suitably-sized Pedlar Culvert. You can realize the full value of the liquid manure your animals produce by draining your stable floors with Pedlar Culvert—and that highly valuable manure is usually wasted on farms. Pedlar Culvert makes it easy to water your cattle in winter. And there are a score of other uses for it on the farm.

Nothing vies with Pedlar Culvert as a well-curbing or a cistern lining. The thick galvanizing absolutely protects the metal of these Culverts from rust or corrosion, and the metal itself protects the water supply from contamination. For draining swampy spots around the farm, or for irrigation ditches and under-drains Pedlar Culverts far excel tile or cement piping, are much less costly, much easier to instal and infinitely more durable.

Pedlar Culvert is made in every standard size from 8 to 72 inches diameter, of Special Billet Iron of the the best quality, in extra heavy gauge. This Billet Iron is curved into semi-cylinders—curved while cold, so the sizes never vary a fraction. These half-cylinders are then corrugated by a pressure of sixty tons to the square inch. After being corrugated, the whole surface and each edge is heavily galvanized and made positively rust-proof.



A few hours' work—no special skill needed—and an indestructible culvert is in place ready for use.



PEDLAR CULVERT

is made in Nestable Sections from the Best Billet Iron, heavily galvanized and deeply corrugated.

It is the simplest kind of work to put these half-sections of Pedlar Culvert together permanently. One half-cylinder is placed on another, and the flange-rib on each side is rigidly compressed flat by the huge pressure exerted by a simple but effective tool. No bolts, no rivets, no makeshifts—but a triple-thick locking rib-flange that gives Pedlar Culvert immense strength. Thus it will stand crushing strains that would destroy any other piping.

This peculiar flat-flange, triple-thick rib makes the most perfect joint possible—nearly as good as if it were welded. Yet it allows for expansion and contraction under heat or cold. Thus a Pedlar Culvert will not spring nor split even though frozen solidly full of ice. Also the triple rib flange principle makes it possible to break joints in putting this Culvert together, something you cannot do with any other culvert or with cement piping or tile.

Pedlar Culverts are the most portable, as well as the most durable of any piping for any purpose. Being made in half cylinders, they are nestable—so that a great many linear feet of culvert occupy but few cubic feet of car or wagon space. This economizes freight and carriage costs, and makes it easy to transport this Culvert even in rough country. You should get the free book and sample culvert that makes the whole story clear. State your possible needs when you write for the book, and let us quote prices.

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OTTAWA
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TORONTO
111-113 Bay St.
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[illegible] King St
CHATHAM
200 King St. W.
PORT ARTHUR
45 Cumberland St.
WINNIPEG
76 Lombard St.
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OF OSHAWA, CANADA

(Largest Sheet Metal Manufactory in the British Empire)

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include in the output of their immense factory the below-mentioned specialties in sheet metal building material. Samples, descriptions and prices of any of these will be readily forwarded postpaid and free upon request addressed to the Pedlar warehouse nearest to the inquirer:

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Pennsylvania R. R. Terminal

THE Pennsylvania Railroad Terminal in New York City is the central feature of an improvement whose total cost will reach $100,000,000. It is a magnificent structure built for efficiency, almost regardless of cost.

It is covered with a Barrett Specification Roof with vitrified tile surface.

Would such a roof have been used on this magnificent, modern, fireproof structure if anything better could be obtained at *any* price? Surely not.

The fact is, a Barrett Specification Roof is the most economical roof covering yet devised. And it has a record of fifty years of satisfaction behind it.

In addition to the great roof, the foundations are waterproofed with Coal Tar Pitch and Felt—the same materials as are used in Barrett Specification Roofs.

Before construction was commenced, a careful study was made by the chemists of Pennslyvania Terminal Company of many waterproofing compounds, with the result that it was decided to use Coal Tar Pitch instead of Asphalt.

About 4,000,000 pounds of Barrett's pitch were used for underground work and roofing.

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constructed throughout in the

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Rapidity of erection was a feature.

ARCHITECTS—If you wish the best material on the market, and adequacy of design, freedom from worry, the services of our splendid organization and engineering department coupled with economical construction

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We will cheerfully assist you in any way.

CONTRACTORS—if you desire prompt delivery, materials easy and economical to handle, a great elimination of field labor, materials cut to exact lengths order Kahn System materials:

Kahn Trussed Bars for beams and girders, Cup Bars for floors and columns, Rib Metal for floors and Roofs, Hy-Rib for roofs, walls and partitions, Rib Lath for plaster work, Column Hooping, Trussed Chemical Products including waterproofers and finishers

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Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

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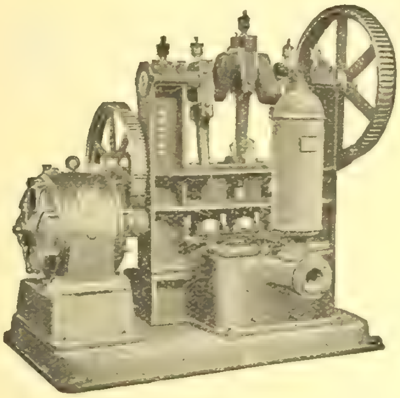

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Phone Main 1054
Works: Seneca Falls, N.Y.

Every City Engineer

Appreciates the fact that the economy in paving brick is the wearing quality.

"The Best Paving Block Made"

Daily Capacity 500,000

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is designed to meet a condition and meets it every time

Every architect or contractor who has a lighting problem to solve should recommend **"Luxfer-Prisms"** every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

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¶ For Roadways and Sidewalks also specially adapted for

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is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

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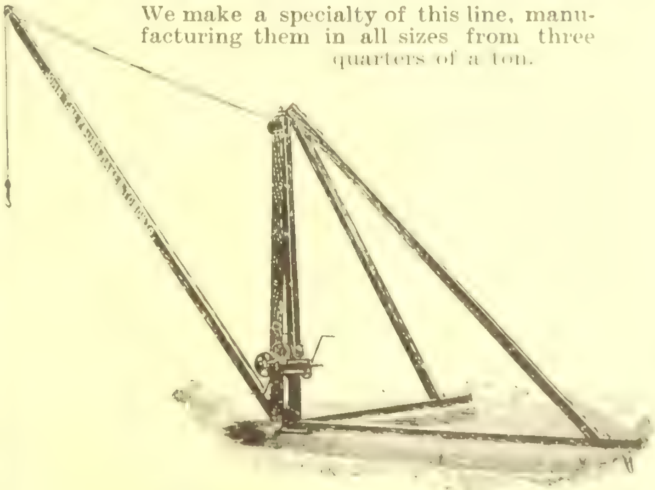
We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds

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Sometimes people ask why

Perfection Wire Mesh

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weighing less and consequently costing less than other concrete reinforcement will give the same strength.

It is the quality of the wire. It is made from a special grade of high carbon cold drawn wire having an elastic limit of 110,000 lbs. per square inch. It **has to be perfect** wire. It would break while being cold drawn if it wasn't.

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First, because we use superior dies and the heaviest drop presses and are thus able to bring out every detail of the design clearly and accurately.

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Send us your name and address so that we can mail you a copy of our handsome book of Louis XIV, Gothic and Colonial designs.

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"Hammer Brand" Hard Wall Plaster

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It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

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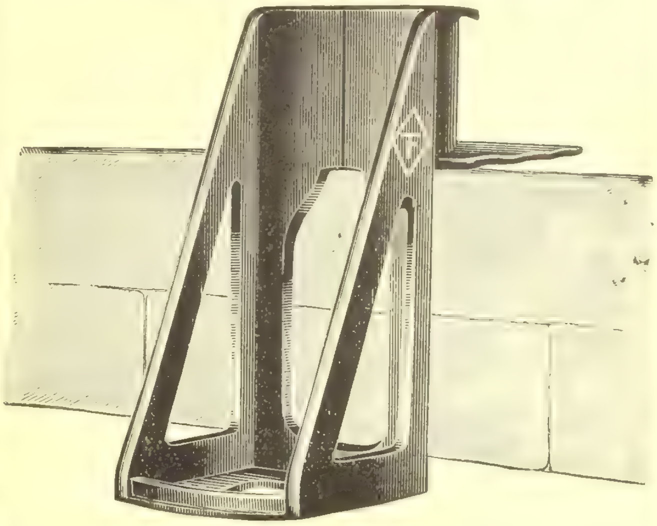
ALL SIZES AND STYLES



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The man who knows a good thing when he sees, and who wants a good thing when he hears of it, is the man who will insist upon having

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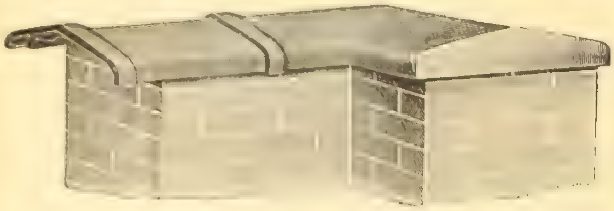

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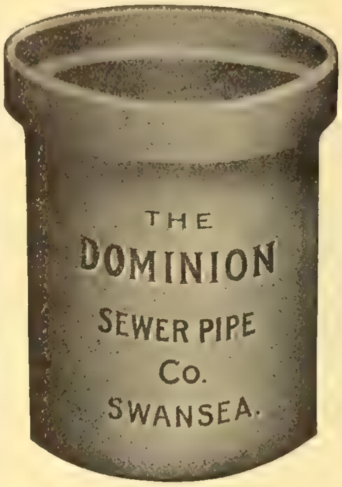

True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

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Wall Coping
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SWANSEA (near Toronto)

Sewer and Culvert Pipes

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

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Factories:
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Glazed Earthenware

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Single and Double. Strength, 3″ to 36″

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Samples furnished on request.

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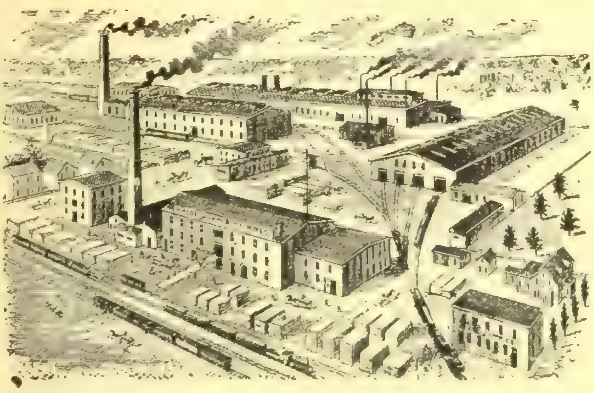

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Hamilton Pipe

Established 1860
Large Flanges

Not necessary to chip
HAMILTON PIPE
in making connections.

Because they know that they will not be held up on delivery.

Because they know that our goods have proven good for 50 years.

Because they know that our prices are always right.

Because they know that our mode of loading insures safe delivery.

Because they know that these are all facts.

Insist on our goods and you too will wear that satisfied look.

The Hamilton and Toronto Sewer Pipe Company, Limited
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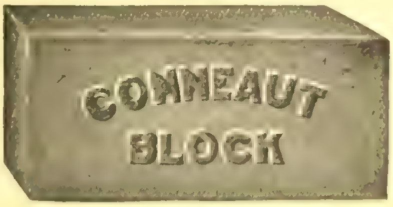
We Pave the Way

for superior roadway construction.



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Our situation insures foremost shipping facilities to all Canadian Points.

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We Manufacture the Highest Grade

Hardwood Flooring

That Can Be Produced Anywhere

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

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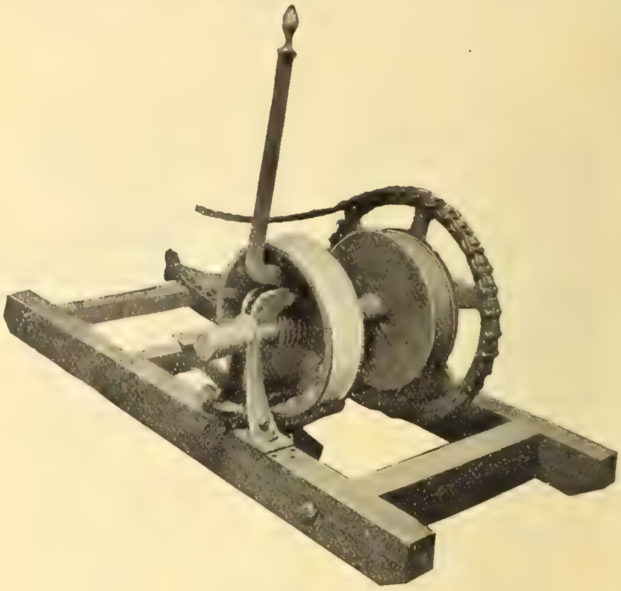

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Here are a few of its many uses

Contractor's Work	Mortar Conveying	Well Digging
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This hoist can be used with any make or style of gas, gasoline or oil engine

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Engineers and Machinists London, Canada

Door No. B L 31

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Newel Posts
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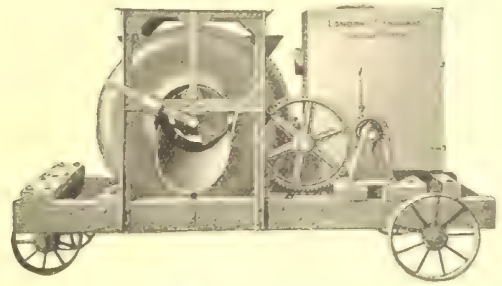

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Collingwood, Ont.

Tenders addressed to K. S. Macdonell, town engineer, will be received until May 23rd for sewer extension of Second street, between Birch and Oak streets.

Claresholm, Alta.

A by-law will be voted on to issue $15,000 20-year 5 per cent. waterworks debentures. Geo. Simpson, secretary-treasurer,

Fort Frances, Ont.

Bids will be received until May 26th by W. H. Elliott, Town Clerk, for furnishing material and constructing an extension to the sewerage system, including vitrified tile pipe and junctions, c. i. manhole covers, etc.

Hull, Que.

Tenders addressed to J. F. Boult, city clerk, will be received until May 23rd for the construction of artificial stone sidewalks and also of pipe sewer on Champlain street.

Huntsville, Ont.

Tenders will be received until May 30th for road improvement debentures representing $12,000. See advertisement in this issue.

Kamloops, B.C.

A by-law to borrow $40,000 for extension of waterworks will probably be summitted shortly.

La Tuque, Que.

It is stated that the council will shortly call for tenders for the construction of a waterworks system. Estimated cost, $300,000.

Medicine Hat, Alta.

The ratepayers voted $20,000 for street making machinery, $30,000 for cement walks, $55,000 for plank walks and $35,000 for sewers.

Montreal, Que.

The Board of Control have recommended the expenditure of $3,500 for permanent works in Mount Royal Park for the construction of a public lavatory and improvements to roadways.

The time for receiving tenders for pavement and sidewalk construction has been extended to May 19th. L. O. David, city clerk.

Nanaimo, B.C.

Tenders will be received for the construction of from four to eight miles of concrete sidewalks. Allan Waters, City Engineer.

Ottawa, Ont.

N. H. H. Lett, secretary, Board of Control, writes that no action will be taken regarding the awarding of tenders for paving Bank and O'Connor streets, the Board having suspended [illegible] until after the 20th inst.

Prince Rupert, B.C.

Thos. Dunn, Peter Black and Dr. McIntyre are in charge of the expenditure of the $25,000 appropriated by the Provincial Government for sewer work.

Regina, Sask.

Tenders are being called until June 6th for construction of sewage disposal works. A. E. Chivers, city clerk. See advertisement in this issue.

Tenders addresed to A. E. Chivers, city clerk, will be received until May 30th for pavement and sidewalk construction. L. A. Thornton, City Engineer. See advertisement in this issue.

Tenders are being received until May 30th for construction of storm water and sanitary trunk sewers and disposal works. See advertisement in this issue.

The ratepayers sanctioned the following by-laws: Sidewalks, $10,000; pavements, $115,000; trunk sewer, $280,000.

South Vancouver, B.C.

Ratepayers carried road improvement and sidewalk construction by-laws.

St. John, N.B.

This municipality is calling for tenders until May 31st for paving, waterpipe and sewer excavation and sewer and waterpipe. See advertisement in this issue.

City Engineer Murdoch's plans for the renewal of water pipes were accepted. Estimated cost, $38,000. Tenders will be called.

St. Thomas, Ont.

Hazen & Whipple, who were engaged to report on waterworks extensions here, have recommended improvements to cost $32,000. They include: Construction of a coagulating basin (at $7,500), and aerator (at $1,000), on side hill near the pumping station, at distance of about 500 feet, $8,500; connections to and from this basin to the pumps, to consist of 80-inch cast iron pipe, $3,000; installation of two electrically-driven centrifugal pumps to be installed in the present station, taking water from the reservoir and lifting it to the aerator above coagulating basin, $1,500; the construction of a pure water reservoir of covered concrete, reinforced with steel, with fire equipment and a capacity of 600,000 gallons, near present station below level of filters connecting piping from present filters to this basin, $8,500; installation new coagulating apparatus and controllers on discharge lines to regulate the flow of the filter, $2,500; installation of proper loss of head gauges, $2,500. The cost of engineering in connection with this was estimated at $4,200, making a total of $32,200. The consulting engineers agreed with most of the details of a report presented previously by [illegible] A. Bell.

Toronto, Ont.

Tenders are being received until May 31 for construction of chimney at pumping station of filtration plant at the Island. See advertisement in this issue.

Victoria, B.C.

Pending the preparation of specifications the invitation for pavement tenders has been postponed. Angus Smith, City Engineer.

City Engineer Smith was instructed to prepare a statement of what work could be done this year on the trunk thoroughfares and the cost and to call for tenders for several works. Contracts will be awarded by council on May 23rd.

Vancouver, B.C.

Board of Works have decided on a general sewerage scheme for Mount Pleasant and Fairview. The work will cost over a hundred thousand dollars, and tenders will shortly be invited.

W. McQueen, city clerk, sends us the following list of tenders received for construction of wood block pavement on Robson street from the east side of Burrard street to the west side of Bute street: T. R. Nickson & Company, $29,891; M. P. Cotton Company, Limited, $33,857; Palmer Bros. & Henning, $39,800. As yet the contract has not been awarded.

Woodstock, Ont.

Until June 1st tenders for $50,000 30-year debentures (interest at 5 per cent.) to be used in road improvement, will be received.

Westmount, Que.

Tenders are invited until May 25th by this municipality for paving, etc. See advertisement in this issue.

AWARDED.

Chatham, Ont.

The following tenders for supply of pump were received: The lowest tender, Smart-Turner Company, of Hamilton, at $1,318.40, pump laid down at Chatham (accepted); Parks' tender was the highest received at $1,402.50. There was $1,000 difference between the tender of the Smart-Turner Company and the Canada Foundry Company.

Montreal, Que.

The city road department has awarded the contract for the construction of the Rosemount eastern main sewer to M. Dineen, whose tender was the lowest at approximately $37,000.

Moose Jaw, Sask.

W. F. Heal, City Clerk, is authority for the statement that the contract for 33,000 square yards of paving has been awarded to Kettle River Company, of Minneapolis, Minn., for $106,064. Wood block will probably be used. Noted previously.

Port Arthur, Ont.

Stewart & Hewitson, local contractors, were given the contract for paving Pearl, Park, Van Norman, Cameron and Cumberland streets with block asphalt, while south Water and Court streets will be paved with sheet asphalt by the National Paving & Construction Company.

St. John, N.B.

Contracts have been awarded as follows: 1,000 barrels coal tar at $3.50, Carritte-Patterson Company; 95 tons Trinidad Lake asphalt at $23.50, Robt. Reford Company; [illegible] 10 cubic feet, H. E. Creighton; 40 cords of birch and maple wood at $7.14 a load of 160 cubic feet, Geo. Dick. No bids were received [illegible]

[illegible] spruce paving blocks, 7 inch by 6 inch by 3 inch, the standard required being considered too high. Other bids on tar, $[illegible]; asphalt, $24.75 and $25.00; wood, $8.00.

Saskatoon, Sask.

J. H. Trusdale, City Clerk, sends us the following list of prices in connection with the accepted tender of Western Pavers, Limited, Winnipeg, for concrete sidewalks: Concrete sidewalks, 17 9-10 cents per square foot; concrete curbing straight, 32 cents per lineal foot; concrete curbing, circular, 32 cents per lineal foot; concrete crossings, 17 9-10 cents per lineal foot. The amount to be built this year will amount to about $[illegible].

Toronto, Ont.

Mr. John Wagner, Cleveland, was awarded the contract for the construction of the high level interceptor sewer, in connection with the trunk sewer, at $31 per lineal foot, and Messrs. Ryan & Reilly, Philadelphia, were given the contract for the construction of the trunk sewer syphon at the Don river at $46,000.

Winnipeg, Man.

The following tenders were awarded by the board to the engineer of construction: Sewer on Inkster, from Main to Aikins, $1,283; Selkirk avenue, from Battery to McPhillips, $1,827.70; Bannerman avenue, from McGregor to a point 600 feet west, $863.

The following tenders for asphalt pavements were accepted, the lowest figure in each case being that of the engineer of construction: 24 foot pavement, Stella avenue, from King to Salter street, $15,120.50; 24 foot pavement, Agnes street, from Ellice to Wellington avenue, $20,002.90; 24 foot pavement, Dorchester avenue, from Wellington crescent to Stafford street, $14,743.60; 24 foot pavement, Toronto street, from Portage to Ellice avenue, $17,754.20, full width pavement, Elora avenue, from Main to Schultz street, $10,056.90; 24 foot pavement, Flora avenue, from Schultz to Salter street, $13,110.20; Watermain, Inkster avenue, from Main to Aikins street, $452.35; watermain, Crawford avenue, from Main to Mac street, $489.32.

Yorkton, Sask.

F. T. McArthur, town engineer, writes that the contract for concrete sidewalks has been awarded to Messrs. Conery & Mattaini, of Guelph, Ont., at 18 cents per square foot.

Railroads, Bridges and Wharves

Berlin, Ont.

Tenders are being called until May 19th for the construction of a 35-foot concrete arch near New Dundee, and a concrete bridge floor near Ayr. Bowman & O'Connor, consulting engineers, Toronto. H. J. Bowman, C.E., county clerk.

Collingwood, Ont.

Tenders are being called until May 23rd for a reinforced concrete bridge, 14 foot span, 66 feet wide. Plans, etc., at office of Town Engineer, K. S. Macdonell.

Fort William, Ont.

Tenders are being called until June 3rd for construction of cement bridge, etc. H. S. Hancock, City Engineer. See advertisement in this issue.

Mount Hamilton, Ont.

Tenders addressed to A. G. E. Bryant, township clerk, will be received until May 21st for the construction of cement bridges in the township of Barton. Specifications at office of the reeve, J. Walter Gage.

Miscou, N.B.

Tenders will be received until June 3rd by N. Tessier, Secretary, Department of Public Works, Ottawa, for extension to wharf here. Plans, etc., at office of E. T. P. Shewen, district engineer, St. John, N.B., G. Stead, Chatham, and on application to local postmaster.

Newmarket, Ont.

Tenders are being called until May 22nd for the construction of a reinforced concrete arch bridge 60-foot span, over the Holland river. Barber & Young, consulting engineers, Toronto.

Owen Sound, Ont.

Cleveland capitalists are interested in the project for railroad between here and Meaford. A street railway service is also in the plan. Mayor Harrison.

Paisley, Ont.

Tenders addressed to Denis Phelan, reeve of Township of Greenlock, will be received until May 26th for the building of a 2-span flat arch bridge, 80 feet long, at Stark's mill. Plans, etc., with above-mentioned. Thos. H. Purdy, clerk of Greenlock, Narva.

Saskatoon, Sask.

Tenders are being received until May 23 for the extension of the C. P. R. freight sheds here. Plans, etc., at office of Frank Lee, Division Engineer, Winnipeg, Man.

Toronto, Ont.

Tenders are being called by the T. & N. R. R. until May 17th for supply and erection of a 50,000 gallon steel tank. A. J. McGee, secretary-treasurer.

AWARDED.

Croton, Ont.

The contract for the bridge over the Sydenham river, has been let to the Western Bridge & Equipment Company, of Chatham, for $1,100. Bridge to be completed by July 1st.

Orillia, Ont.

The Toronto Construction Company has been awarded the contract for the construction of the C. P. R. from Coldwater to Atherly Junction. The contract will run into about half a million dollars.

Peterborough, Ont.

E. M. Elliott, county clerk, sends us the following tenders for Nogey's Creek bridge superstructure: Jencks Dresser & Company, Sarnia, $1,865; Dickson Company, Campbellford, $1,574 (accepted); Hamilton Bridge Works, $1,515.

Sault Ste. Marie, Ont.

The O'Boyle Construction Company has been awarded the contract for the construction of 31 miles of railroad between Hawk Lake and Hobon.

St. Thomas, Ont.

Tenders for the erection of concrete bridges over the Salty Creek and the Union Pond, were as follows: Salty Creek—J. W. Chivers, $1,100; Jas. Vincent, $1,275; Williams & Walker, $935; Powles & Gunning, $997; Isa Prew, $1,225; C. C. Stafford, $1,329. Union Bridge—J. T. Leverton, $3,100; James Vincent, $1,895; C. C. Stafford, $1,899; Powles & Gunning, $2,169. The tender of Powles & Gunning for the Salty bridge and of James Vincent for the Union bridge were accepted.

Woodstock, Ont.

The County of Oxford called for tenders for the construction of a 125-foot steel bridge with concrete abutments. The contract was given to the Hunter Bridge and Boiler Works Company, Kincardine, Ont. Contract prices were: Superstructure and floor, $3,200; abutments $776. A contract was awarded to M. M. Hiles, of Attwood, for a 30-foot reinforced arch of $898.

Winnipeg, Man.

The contract for the supply of steel work and wire carrying device on Redwood bridge has been awarded by the Board of Control to the Western Iron Works.

Public Buildings, Churches, Schools, etc.

Arnprior, Ont.

Tenders are being received until May 30th for the erection of an addition to and alterations in the high school building. See advertisement in this issue.

Beaverton, Ont.

Mr. J. F. Givens, secretary of the Library Board, has received Carnegie grant of $5,000 towards library, which will be erected at once.

Brandon, Man.

At a meeting of representative fraternal societies the question of the erection of a fraternal temple was favorably considered. Estimated expenditure, $50,000.

Cranbrook, B.C.

Contractor McCallum has commenced work on the new Y. M. C. A. building.

Comber, Ont.

Tenders for the erection of a brick church, 80 x 46, with stone basement, will be received by the managers of the Presbyterian congregation until May 31. Plans, etc., at the manse, work to be completed by November 25th. J. Fraser Smith is interested.

Edmonton, Alta.

A by-law to raise $175,000 for a general hospital will be submitted to the people shortly.

Fergus, Ont.

Tenders will be called shortly for electric wiring, hot water heating, slate roofing for the Carnegie library here.

Hull, Que.

At the next council meeting a site will likely be decided on for the civic hospital. D. Aubry and Father Duhant are interested. Noted previously.

Haileybury, Ont.

Tenders addressed to J. H. Shibley, secretary-treasurer, High School Board, will be received until May 25th for the erection of high school. Plans, etc., at office of A. D. Pillar, architect, and at C. Preston's store, this place.

Hamilton, Ont.

Tenders are being called until May 23rd for the various trades required in the erection of police and patrol station. Plans, etc., at office of architects, Messrs. Stewart & Witton, this city. S. H. Kent, city clerk.

On June 6th a by-law will be submitted to the ratepayers of Wentworth County to issue $40,000 20-year debentures for the purpose of building a house of refuge.

None of the twenty plans for Carnegie library submitted by architects all over the country was satisfactory to all of the members of the board, and it was decided to submit them to a competent American architect.

Kinmount, Ont.

The Roman Catholics intend to erect a new church at once. Rev. Father Galvin is interested.

Montreal, Que.

Plans have been prepared and tenders are invited until May 19th for the construction of an annex to the Westmount public library. Mr. Robert Findlay, architect.

Messrs. Hutchison, Wood & Miller, architects, are preparing plans for the erection of a church building, corner Mance and Prince Arthur streets for the First Presbyterian Church. Tender for this will be invited at a later date.

A movement is on foot to erect a modern institution for the blind at a cost of $100,000. The Montreal Association of the Blind, (President, C. W. Lindsay), are interesting themselves. It is stated that Mr. A. F. Dunlop, architect, Lindsay Building, has offered to draw the plans for this building at his own expense.

It is stated that the Grand Trunk Boating Club will have a 125-foot wharf built on the opening inshore for the use of motor boats during the current season. Work of laying the wharf will commence immediately.

It is rumored that the St. James Methodist Church have secured an option on property on Drumond street with the intention of erecting a church building as soon as their property on St. Catherine street can be disposed of to advantage.

New Westminster, B.C.

The Fraser River Motor Boat Club, now being formed, have the erection of a club house under consideration. J. P. Hampton Bole is interested.

North Battleford, Sask.

The ratepayers voted $7,000 for a city store house and $10,000 for agricultural society buildings.

New Liskeard, Ont.

The council have decided to accept Andrew Carnegie's offer of $10,000 for a public library here. Mr. Lester Neil is interested.

Ottawa, Ont.

The Department of Trade and Commerce is sending out specifications of a building which is to be erected by the Australian Government at Melbourne for the ''Commissioners of Savings Banks,'' with the object of having Canadian architects submit competitive plans. Prizes of $1,000, $600 and $250 are offered.

Prince Rupert, B.C.

Monro & Lailey are calling for tenders for the erection of the hospital here and also for the same at Stewart to be erected by Dr. W. T. Kergin.

Peterborough, Ont.

Tenders addressed to G. H. Duncan will be received until May 25th for the construction of the isolation hospital. Plans, etc., at office of the architect, W. Blackwell, C.E. S. R. Armstrong, city clerk.

Port Arthur, Ont.

N. G. Neill, Industrial Commissioner, writes that the following buildings are to be erected: Y. M. C. A., costing about $40,000; an armory, costing $100,000, is under consideration, and a Carnegie library, costing $40,000.

Renfrew, Ont.

Mr. Garvock, school architect, Ottawa, has been asked to prepare plans for the erection of a rear addition to the Model School. Estimated cost, $30,000. The remodelling of the collegiate was also considered.

Regina, Sask.

Ratepayers sanctioned the following money by-laws: Collegiate, $[illegible]; Isolation hospital, $18,000; Children's Shelter, $10,000; Hospital, $25,000.

Saskatoon, Sask.

School Board decided to issue $62,000 debentures and build a new school.

Shoal Lake, Man.

Tenders addressed to E. Hepworth, secretary-treasurer, will be received until June 1st for erection of frame or cement school house. Plans on application.

St. John, N.B.

City Engineer Murdoch has estimated the cost of a new incinerator plant from $50,000 to $100,00. The council is considering it.

Strathcona, Alta.

Subscriptions are being taken for the building of St. Luke's Church. W. A. Dixon, people's warden.

Plans have been prepared for the Oblates of Mary Immaculate for their academy, for which a site has been selected. One wing will be erected this summer. Rev. Father Jan, of St. Anthony's Church, is interested.

Toronto, Ont.

Tenders are being called until the 23rd inst. for the furnishing and installing all heating and electrical apparatus, etc., required for the Central Light, Heat & Power Plant in the University of Toronto. Darling & Pearson, 2 Leader Lane, architects. See advertisement in this issue.

A permit for the erection of the extension to the Church of Our Lady of Lourdes, corner of Sherbourne and Earl street, at a cost of $60,00,0 has been issued by the City Architect.

Tenders are being received until May 30 for roofing, galvanized iron work, etc., required in connection with new Isolation Hospital. See advertisement in this issue.

Virden, Man.

Tenders addressed to John Pritchard, treasurer, will be received until May 25th inst. for the erection of a parish hall for St. Mary's church. Plans, etc., at office of the above mentioned, and at the office of the architects, Matthews & LeMaistre, 305 Fort street, Winnipeg, Man., or at the residence of Rural Dean Reeves, St. Matthew's rectory, Brandon.

Vernon, B.C.

The Curling Club will erect a rink here to cost about $4,000. Dr. MacDonald is interested.

Vancouver, B.C.

The Swedish Lutheran Church will erect their new church on corner Pender street east and Carl avenue. Estimated cost, $23,000. Building committee, Rev. C. R. Swanson, president; A. Johnson, secretary, and A. Nelson, treasurer.

Winnipeg, Man.

Plans for the two new collegiates have been approved by the school board and tenders will be called at once. Estimated cost of each building, $250,000. Plan for the one at South Winnipeg called for a 3 storey building 220 x 180 feet, lower portion of Tyndall stone, upper red brick, etc.

The erection of a new city hall in the near future is being considered, also a suggestion that competitive plans be called for in the fall. Aldermen Douglas and Midwinter and Controllers Harvey and Waugh are interested.

St. John's Cathedral is to be replaced at once with a new stone building. Plans were acepted for a magnificent cathedral but in the meantime only part is to be built, which will be added to as funds are available. Total cost $200,000.

The Olivet Baptist Church, St. James, have decided to take an option on property to be used as a site for their new church, which will be erected eventually.

AWARDED.

Amherstburg, Ont.

C. Williamson, architect, of Watt, Jacques & Williamson, Windsor, sends us the following list of successful tenders for the 8-room school in Amherstburg: Mason work, J. Wilson, of Amherstburg, $5,850; carpenter work (Georgia pine and maple floors), V. Williamson, of Walkerville, $5,419.76; lathing and plastering, J. Wilson, of Amherstburg, $1,044; heating and ventilating (Pease system), Ryan & Company, of Amherstburg, $2,169.75; painting and graining, Whipple & Bennett, of Walkerville, $825; metal work, Robt. Paddon, of Windsor, $266. Plumbing contract to be let later. Total cost, about $16,500.

Fergus, Ont.

P. Perry, secretary-treasurer, library board, sends us the list of tenderers for the new library here: Plastering: W. Stafford, Elora, $227 (accepted); P. Martin, Guelph, $330; J. J. Mahoney, Guelph, $357; Richardson & Ritchie, Elora, $375. Painting: W. Bergin, Elora, $300; W. McCullough, Fergus, $410. Carpentering: J. Moffatt, Fergus, $1,853.85; M. Smellie, Fergus, $2,150. Masonry and excavating: T. Wickie, Fergus, tool faced $2,065, rock faced $1,890 (tender), Fergus and imported stone $1,388; A. Irving, Guelph, tool faced $2,700, rock faced $2,550, Fergus and imported stone $2,065. Metallic ceiling: J. Chapman, Fergus, $865; Occomore, Guelph, $142.50; Guelph Stone Company, $149; Howard, Guelph, $186. Eaves: T. Kerr, Fergus,, $40.

Medicine Hat, Alta.

Morton Fulton has been awarded the contract for the erection of a $20,000 addition to the General hospital.

Moose Jaw, Sask.

The local firm, Navin Bros., have been awarded the contract for the erection of the Provincial Government Telephone and Land Titles Building. Amounts of contracts, $25,713 for the telephone building and $35,920 for land titles office.

Montreal, Que.

The contract for the electric wiring and installation in the new Alexander School has been awarded to the Sayer Electric Company. A. F. Dunlop, architect.

Messrs. Peden & MacLaren, architects, have awarded contracts as follows for the erection of the Kensington School at Notre Dame de Grace for the Protestant School Commissioners of Coteau St. Pierre. Excavation, brick work and masonry, Robertson Bros., Westmount; carpentry work, Laird, Paton & Son, Limited; painting and glazing, J. A. Alexander; roofing, Metal Shingle & Sliding Company, Limited; lathing, and plastering, Gray & Wighton; plumbing, hot water heating and ventilating, Geo. R. Woodburn & Company.

Ottawa, Ont.

C. MacNab, chairman, pro tem., Building Committee, sends us the following list of tenders. Those recommended for acceptance were in last issue:--Hopewell Avenue School—Masonry, brick and concrete work: G. A. Crain, $29,600; John Robertson & Son, $29,687.50; Alexander & Campbell, $30,346; T. C. James, $33,500. Carpentering: Taylor & Lackey, $9,630; Alex. Christie, $10,780; J. W. Featherstone, $10,793, deduct for flooring, $335, $10,458; A. Richards & Company, $10,842; T. A. Shore, $11,223, deduct for flooring $538, $10,685; A. G. Marshall, $12,750, deduct for flooring $508, $12,242. Plastering: Chas. Hunt, $1,[illegible]. [illegible] & Company [illegible] Painting and Glazing: John Strang & Son, $1,600; Ritchie & Nunn, $1,985. Roofing: J. Herbert & Son, $284; J. D. Sanderson, $300; McFarlane & Douglas, Limited, $307. Electrical Work: McCallum & Company, $1,298; J. A. L. Ellacott, $2,174. Heating: J. R. McLennan, 2 C. I. boilers, Johnston system $4,684; J. M. McLennan, 2 C. I. boilers, gravity system, $4,098; J. R. McLennan, 2 C. I. boilers, Webster system, $5,384; J. R. McLennan, 1 steel boiler, Johnson system, $4,684; J. R. McLennan, 1 steel boiler, gravity system, [illegible], J. R. McLennan, 1 steel boiler, Webster system, $5,384; Currie & Livock, 2 C. I. boilers, Johnson system, $4,500; Currie & Livock, 2 C. I. boilers, gravity system, $3,820; Currie & Livock, 2 C. I. boilers, Webster system, $4,250; Currie & Livock, 1 steel boiler, Johnston system, $4,450; Currie & Livock, 1 steel boiler, gravity system, $3,745; McKinley & Northwood, 2 C. I. boilers, Jonnson system, $4,229; McKinley & Northwood, 2 C. I. boilers, gravity system, $3,715 McKinley & Northwood, 2 C. I. boilers, Webster system, $4,192; McKinley & Northwood, 1 steel boiler, Johnson system, $4,361; McKinley & Northwood, 1 steel boiler, gravity system, $3,847; McKinley & Northwood, 1 steel boiler, Webster system, $4,324. Plumbing: McKinley & Northwood, Mott's closet $3,466; Clow closet, 1, $3,441; Clow closet 2, $3,475; standard closet 3, $3,595. Ventilation: Sheldons, Limited, standard fan with 5 h.p. motor, $1,050 or $1,925 for both schools, f.o.b. Ottawa; The Canadian Buffalo Forge Company, Multivane fan with 3 1-2 h.p. motor $1,157, standard fan with 3 1-2 h.p. motor $927, standard fan with 5 h.p. motor, $992; The Green Fuel Economizer Company, standard fan with 5 h.p. motor, erected, $1,205. Galvanized iron work: McFarlane & Douglas, Limited, $1,267; McKinley & Northwood, $1,391. Bulk tender: Taylor & Lackey, including Excavating, masonry, brickwork, fireproofing and concrete, plastering, roofing, galvanized iron, painting and glazing, electrical work, $45,371. Breeze Hill Avenue School: Masonry, brick and concrete: G. A. Crain, $28,480; Alexander & Campbell, $29,207; John Robertson & Son, $32,609; T. C. James, $37,900. Carpentering: Taylor & Lackey, $9,279; A. Richards & Company, $10,442; J. W. Featherstone, $10,487, deduct for flooring $295, $10,192; T. A. Shore, $10,824, deduct for flooring $505, $10,319; A. G. Marshall, $11,200; Alex. Christie, $11,340. Plastering: Thos. Brethour & Company, $1,590; Chas. Hunt, $1,650. Painting and glazing: John Strang & Son, $1,950; Ritchie & Nunn, $1,850. Roofing: J. Herbert & Son, $260; J. D. Sanderson, $260; McFarlane & Douglas, Limited, $297. Heating: J. R. McLennan, 2 C. I. boilers, Johnston system, $4,571; J. R. McLennan, 2 C. I. boilers, gravity system, $4,005; J. R. McLennan, 1 steel boiler, Johnston system, $4,571; J. R. McLennan, 1 steel boiler, gravity system, $4,005; Currie & Livock, 2 C. I. boilers, Johnston system, $4,493; Currie & Livock, 2 C. I. boilers, gravity system, $3,795; Currie & Livock, 2 C. I. boilers, Webster system, $4,217; Currie & Livock, 1 steel boiler, gravity system, $3,715; Currie & Livock, 1 steel boiler, Webster system, $4,147; McKinley & Northwood, 2 C. I. boilers, Johnston system, $4,296; McKinley & Northwood, 2 C. I. boilers, gravity system, $3,676; McKinley & Northwood, 1 steel boiler, Johnston system, $4,428; McKinley & Northwood, 1 steel boiler, gravity system, 3,771; Electrical work: McCallum & Company, $1,248.78; J. A. L. Ellacott, $2,142. Plumbing: McKinley & Northwood, Mott's closet, $3,455; Clow closet 1, $3,580; Clow closet 2, $3,600; standard closet 3, $3,585. Ventilation: Sheldons, Limited, multivane fan with 3 1-2 h.p. motor, $1,100 or $2,100 for both schools; standard fan with 5 h.p. motor, $1,050 or $1,925 for both schools, f.o.b. Ottawa; the Canadian Buffalo Forge Company, multivane fan with 3 1-2 h.p. motor, $1,157; standard fan with 3 1-2 h.p. motor, $927; the Green Fuel Economizer Company, standard fan with 5 h.p. motor, erected, $1,205. Galvanized iron work: McFarlane & Douglas, Limited, $1,047; McKinley & Northwood, $1,163. Bulk tender: Taylor & Lackey, including excavating, masonry, brickwork, fireproofing and concrete, plastering, roofing, galvanized iron, painting and glazing, electric wiring, $43,414.

St. Thomas, Ont.

The contract for frescoing the Central Methodist church has been awarded to the firm of Simpson & Carter, church decorators, Sarnia.

Saskatoon, Sask.

For the new Caswell Hill School a contract has been let to Shannon Bros. & Cassidy at $37,973. Other tenders were: Saskatoon Building and Construction Company, $48,973; J. E. Farley, $41,700; Bigelow Bros., $36,000, and Walter Bennett, $36,250.

Toronto, Ont.

Contract for the galvanized iron and roofing work on the Italian Mission, Teraulay and Elm streets, has been awarded to the A. B. Ormsby, Limited.

Winnipeg, Man.

The contract for the two fire stations and drill tower has been let to John Saul. Total cost, $38,975.

Residences

Hamilton, Ont.

Recent building permits include: W. E. Goring, ten frame dwellings, on Shaw street, $8,000; Giles & Beck, brick dwelling on Locke street, for D. J. Forest, $2,100.

Montreal, Que.

Plans and specifications are being prepared for the erection of a residence on Cedar avenue for Mr. J. Bryce, and tenders will shortly be invited. Philip J. Turner, F. R. I. B. A., architect.

Tenders will shortly be invited for the erection of twenty-five houses in Brooklyn Park, St. Lambert, Que., Mr. Philip J. Turner, F. R. I. B. A., architect.

Tenders are invited for the erection of a residence on Cedar avenue for Wm. Agnew. Mr. Philip J. Turner, F. R. I. B. A., architect, Board of Trade Building.

Tenders for the erection of a residence corner Cote St. Antoine and Mount Steven avenue for Dr. H. M. Church, were received until May 14th. Hutchison, Wood & Miller, architects.

Tenders for the erection of a residence on McGregor street for H. P. Walker, have been received by MacVicar & Heriot, architects, but no contracts have as yet been awarded. (Note.—In our issue of May 11 this was erroneously credited to J. Resther & Sons, arcihtects.)

Tenders have been received for the erection of a residence on Rosemount avenue for Mr. F. E. Devlin. Geo. T. Hyde, architect.

Outremont, Que.

Tenders close May 20th for the erection of a residence in Outremont for De Gaspe Beaubien. Messrs. E. & W. S. Maxwell, architects.

St. Thomas, Ont.

N. R. Darrach has a permit for residence for Jos. Griffin, $2,000.

Strathcona, Alta.

Wilson & Herrald received tenders until May 14th for the erection of residences for Dr. Tory and Prof. Edwards. Plans are being completed for the residences of Dr. Lehmann and Dr. Kerr.

Victoria, B.C.

A Shotbolt has a permit for a frame one-storey dwelling on Quadra street, $2,500.

Winnipeg, Man.

P. C. Samuels, architect, has prepared plans for the apartment block to be erected on the southeast corner of Langside street and Preston; cost $100,000. Work will be done by day labor.

AWARDED.

Montreal, Que.

Contract for the erection of three flats on St. Hubert street, for Mr. Victor Martineau, has been awarded to D. Morel, general contractor. Mr. Dalbe Viau, architect.

Mr. Alphonse Piche, architect, has awarded the contract for the erection of a residence for P. O. Nadeau, to Mr. L. Dalbec, general contractor.

The contract for alterations to residence on Sherbrooke street for Mr. W. Watson has been awarded to John Allan, 300 Atwater avenue. Messrs. Peden & MacLaren, arcihtects.

The contract for masonry work on house for E. J. Ferguson, Ontario avenue, has been awarded to J. H. Hutchison. Other trades not let. Kenneth G. Rea, architect.

The contract for the erection of a tenement house on Laugauchetiere street east for Rev. Heffernan, has been awarded to J. T. Tobin, general contractor. John Jas. Browne & Son, Limited, architects.

Contracts for the different trades in connection with the erection of a residence, corner Boulevard St. Joseph and St. Urbain street, estimated cost $7,500, for Mr. H. Pelletier, K.C., have been awarded as follows: Excavation, Eug. Hassard; masonry and brick work, Clovis Morin; carpentry and joinery, Carriere & Frere; plastering, J. C. Parent; painting and glazing, F. X. Lavallee; roofing, plumbing and heating, Jos. Sigouin. Mr. Jos. Perault, architect.

Business Buildings and Industrial Plants

Bridgeburg, Ont.

Arrangements have been completed for the establishment of a Canadian branch of a marble working firm of Buffalo, N.Y. About three acres of land constitute the site, and $100,000 the expenditure.

Chippewa, Ont.

The Lantz Company, 861 Main street, Buffalo, marble and onyx works, has completed plans for the establishment of a Canadian branch plant at Chippewa, Ont.

Cornwall, Ont.

It is stated that the Bell Telephone Company will shortly proceed with the erection of a new telephone exchange to replace their office in the Rossmore hotel which was recently destroyed by fire.

Dunnville, Ont.

The International Tool Company, of Canada, at Welland, will build a plant at Dunnville.

East Selkirk, Man.

The Lake of the Woods Milling Company are laying out the site for their new elevator here.

Edmundston, N.B.

The store and dwelling owned by G.

Mosher were damaged to the extent of about $3,500 on the 8th inst.

Edmonton, Alta.

Representatives of the Red River plow works are negotiating as to their removal here. Mayor Lee.

Fort William, Ont.

Plans for the erection of a two storey annex to the Dyke block, frontage 40 feet, have been approved by J. Dyke. Cost, $20,000.

Guelph, Ont.

Ald. Pequegnat, chairman of the Railway and Manufactures Committee of the City Council, is in receipt of the plans for the proposed new C. P. R. station. These have been accepted by the railway authorities.

Grandview, Man.

T.fl A. Burow's saw mill was destroyed by fire on the 11th inst. Estimated loss, $50,000.

Hull, Que.

The damage on property due to the recent explosion is estimated at about $70,000, distributed as follows: Explosives Company, $10,000; houses and furniture, $10,000; plate glass in Ottawa, $10,000.

London, Ont.

It is rumored that the Armour & Company are considering sites for a large abattoir here.

Montreal, Que.

Plans and specifications for a brick extension warehouse 185 by 5 feet for the Dominion Tobacco Company, 80 Papineau avenue, are being prepared; estimated cost $25,000. E. J. P. Courval, 714 Laval avenue.

North Hatley, Que.

The sash and door factory of T. V. Reed was damaged to the extent of about $10,000.

Owen Sound, Ont.

The Bell Telephone Company will erect a new building as soon as a suitable site can be secured. H. R. Polson, local manager. W. Bruce Taylor, engineering department, Hamilton.

Prince Rupert, B.C.

Westenhaver Bros. are about to build a large business and apartment block.

The block containing the Hotel Northern, Balkan Hotel, Hayner's furniture store, etc., was destroyed by fire on the 5th inst. Total estimated loss, $25,000.

Portage la Prairie, Man.

The Urban Mutual Insurance Company has voted to build a new business block to cost $13,000. Reported in March 16th issue.

Quebec, Que.

The tannery of Messrs. Arthur and Pierre Poulliot on Arago street was destroyed by fire on the 10th inst. Estimated total loss, $36,000.

Regina, Sask.

A company recently incorporated as the Regina Cold Storage & Packing Company, Limited, it is stated, will erect a large abattoir and cold storage plant. Capitalization, $100,000. About $50,000 will be spent on the building. First directors, A. J. Gibson, J. M. Young, F. P. Churchill and J. R. Hicks.

Sarnia, Ont.

The Bank of Toronto has purchased T. Kenny Company's block. The building will be completely overhauled and made into an up-to-date structure.

St. Boniface, Man.

Plans are being prepared for the erection of an 8 storey cereal mill, capacity 300 barrels a day, for the Western Canada Flour Mills Company. Tenders will be called shortly. G. H. Archibald & Company, the general contractors, have the contract for the twenty-seven tubular cement bins. Amount of permit, $150,000.

Toronto, Ont.

Tenders will be received until May 28th for all trades required in the erection of a steel constructed, fireproof warehouse building for Messrs. Hobberlin Bros. & Company, corner Yonge and Richmond streets, and also for the necessary alterations in connection with the renovation of the adjoining buildings. Plans, etc., at office of the architect, E. J. Lennox, 164 Bay street. See advertisement in this issue.

Victoria, B.C.

It is understood that the Warswick Asphalt Pavement Company will erect a plant here, which will involve an expenditure of about $40,000. Capt. J. Warswick, representative. Aldermen Sargison and Langley are interested.

Vancouver, B.C.

Messrs. McArthur & Harper, of Kamloops, have acquired 107 feet of property on Westminster avenue, and 120 feet on Hastings, where it is their intention eventually to erect a large office building.

Welland, Ont.

Fire did damage to the extent of about $2,000 on the 9th inst. to the bakery and residence owned by Mr. R. Schooley and R. Doan respectively.

Winnipeg, Man.

J. H. G. Russell is the architect for the Trust & Loan Company's building.

D. W. Bellhouse has plans under way for the Ashford block on Balmoral street, for which tenders will shortly be called. Tenders are being called for the factory of the Henderson Manufacturing Company, which will cost about $50,000. Architect, D. W. Bellhouse.

The Canadian Oil Company's plant in Elmwood, valued, with stock, at $75,000, was destroyed by fire on the 15th inst.

The Winnipeg Electric Railway have a permit for an addition to their retort house $20,000.

The Factory Equity Grain Bin & Shocker Company, Limited, propose to establish Canadian branches throughout Canada, making Winnipeg their headquarters. It is stated that the factory here will be built shortly. Estimated expenditure, $50,000. Directors, D. W. McCuing, president of the Grain Growers' Association; Dr. F. Torrence and A. R. McDiarmid, Brandon.

D. D. Mann is the authority for the statement that the C. N. R. will erect a building on the site of the old Manitoba hotel before the World's Fair in 1912. Whether the building will be an hotel or office was not stated.

AWARDED.

Goderich, Ont.

J. S. Johnson is superintendent of construction in the erection of tne Western Canada Flour Mills here, for which the art & Company, general contractors, of New York. Estimated expenditure, $200,000.

Montreal, Que.

Contract for alterations to the premises at 871 St. Catherine street west for F. W. Grose has been awarded to Messrs. Simpson & Peel. John Jas Browne & Son, Limited, arcihtects.

The contract for the installation of two electric elevators in the Labelle Building has been awarded the Otis-Fensom Elevator Company. G. A. Monette, architect.

The contract for erection of stable buildings for Messrs. Tees & Company, St. Catherine street west, has been awarded to Shearer, Brown & Willis. Ross & MacFarlane, architects.

The general contract for the erection of the factory building for the H. P. Labelle & Company has been awarded to Mr. Jos. Bourque, general contractor. G. A. Monette, architect.

The general contract for the erection of the Willis Building has been awarded to Peter Lyall & Sons. Amount of permit, $100,000.

Port Colborne, Ont.

The Maple Leaf Milling Company have awarded to the Allis-Chalmers-Bullock Company the contract for transformers, motors (sizes varying from 700 h.p. down to 7 1-2), all switching and wiring apparatus.

Toronto, Ont.

The Bishop Construction Company, Limited, Toronto, have been awarded the following contracts: Canadian National Carbon Company, Limited, Cleveland, Ohio, erection of Toronto plant; Canadian Rubber Company, warehouse, Toronto, T. Pringle & Son, Limited, Montreal, engineers; reinforced concrete building for Peabodys Company, Limited, Walkerville, Ont.

A. B. Ormsby, Limited, has the contract for the galvanized iron, fire doors and roofing work on the Toronto Show Case Building, Carlaw avenue; also for the cornice on No. 4 factory for the T. Eaton Company.

Power Plants, Electricity and Telephones

Bowmanville, Ont.

On May 31st the ratepayers will vote on a by-law to purchase the electric light plant for $12,000.

Brockville, Ont.

Mitchell & Mitchell have been engaged as consulting engineers in connection with the $50,000 improvements to the municipal electric lighting plant.

Dawson, Yukon District.

The North Fork Power Company will soon commence work on the construction of an extensive development on the north fork of the Klondike. Seven and one-half miles of ditch will be built. Charles Boyle, resident manager of the Canadian Klondike Company, has charge of the work.

Francis, Sask.

Tenders are invited for the construction of fifteen and three-quarter miles of rural telephone system. Colin Wells, secretary-treasurer, Rural Telephone Company.

La Tuque, Que.

It is rumored that the municipality of La Tuque will erect an electric lighting plant at an estimated cost of [illegible]

London, Ont.

Tenders will be called for at once for the steel tower to carry the wire into the Horton street subway. Engineer Glaubitz has prepared plans; estimated cost, $850.

Tenders will be called for at once for the building of an underground conduit. [illegible] and [illegible]. Engineer [illegible]erts.

Medicine Hat, Alta.

A by-law to raise $57,000 for the instal

(Continued on page [illegible])

Tenders and For Sale Department

Town of Huntsville

[illegible] offers for sale 20 [illegible] Debentures of $967.91 each, [illegible] for 20 years at 5 per cent [illegible] Tenders received up to MAY [illegible]

T. M. CULLON,
Clerk, Huntsville

21

Tenders Wanted

Sealed bids and separate tenders, marked [illegible], addressed to the Secretary of the Board of Education, Arnprior, will be received up to [illegible] p.m., MONDAY, MAY 30TH, INST., for the erection of an addition to and alterations in the High School Building, Arnprior.

Plans and specifications of the proposed work may be seen at the office of Mr. C. A. R. Dulmage, Chairman of the Contingent Committee, between the hours of 9 a.m. and 5 p.m.

Each tender must be accompanied by a cheque for 5 per cent. of the amount of the tender.

The lowest or any tender not necessarily accepted.

M. D. GRAHAM,
Secretary, Board of Education,
Arnprior, Ont.

21

City of Regina

Pavement Construction

Sealed tenders addressed to the undersigned City Clerk and endorsed on envelope "Tenders for Pavement Construction," will be received up to 12 o'clock noon, MONDAY, MAY 30TH, 1910, for approximately 32,800 square yards of permanent pavement on concrete foundation.

Plans, profiles, specifications and forms of tender are on file in the City Engineer's office, and specifications and forms of tender may be obtained from the City Engineer, and any further necessary information.

A marked cheque for $5,000 must accompany tender. The cheques of unsuccessful tenderers will be returned. The lowest or any tender not necessarily accepted.

L. A. THORNTON, City Engineer.
A. E. CHIVERS, City Clerk.

20

City of Fort William, Ontario

Reinforced Concrete Bridge

Tenders will be received by the City Clerk up to 5 o'clock p.m. on FRIDAY, THE 3RD DAY OF JUNE, 1910, addressed to the Chairman of Works Committee, for the construction of a reinforced concrete arched bridge of 50-foot span, with pile foundations, to be used for double-track street railway, vehicular and pedestrian traffic, crossing the Neebing River on Simpson Street.

All tenders must be on the special form of tender, accompanied by an accepted cheque for a sum equal to 10 per cent. of the amount of the tender, with the envelope sealed and endorsed "Bridge Tender."

Plans, specifications and general conditions may be seen and form of tender obtained at the City Engineer's office.

The lowest or any tender not necessarily accepted.

H. S. HANCOCK, Jr.
City Engineer.

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City of Regina

Sidewalk Construction

Sealed tenders addressed to the undersigned City Clerk and endorsed on envelopes "Tenders for Sidewalk Construction," will be received up to 12 o'clock noon, MONDAY, MAY 30TH, 1910, for approximately 50,000 square feet of concrete sidewalk.

Particulars may be had upon application to the City Engineer.

A marked cheque for $500.00 must accompany each tender. The cheques of unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

L. A. THORNTON, City Engineer.
A. E. CHIVERS, City Clerk.

21

To Contractors

Separate or Lump Tenders will be received until 28TH INST. for all trades required in connection with the erection of a

Steel Constructed Fireproof Warehouse Building

for Messrs. Hobberlin Bros. & Company, on the corner of Yonge and Richmond Streets, and also for the necessary alterations and additions in connection with the renovation of the adjoining buildings. Plans and specifications can be seen and all necessary information obtained at my offices, 164 Bay St.

E, J. LENNOX,
Architect.

20

City of Regina

Province of Saskatchewan

Sewers

Sealed tenders will be received up to noon, MONDAY, MAY 30TH, 1910, addressed to the undersigned, for each of the following contracts for the construction of Storm Water and Sanitary Trunk Sewers and Disposal Works:—

Contract A. The construction of sewers as follows:

10761 feet, 30-inch.
3248 feet, 48-inch.
2369 feet, 5-foot 6 inches.
8392 feet, 6-foot.

Contract B. The supply of 11,500 barrels of Portland Cement for the above sewers.

Contract C. The supply of reinforcement for the sewers.

Contract D, The supply of sewer pipe for branches from the sewers.

Contract E. The supply of manhole covers and other special castings.

Contract F. The supply of 700 cords of Field Boulders for the Percolating Filters.

Contract G. The supply of 3,600 barrels of Portland Cement for the Disposal Works.

Tenders for A. and F. must be accompanied by an accepted bank cheque for $10,000 and $2,500 respectively or other satisfactory deposits for the above amounts.

The deposits of unsuccessful tenderers will be returned as soon as the contracts are signed.

The right to reject any or all tenders or to waive irregularities therein is to be at the discretion of the City authorities.

Plans, specifications, forms of tender and all information may be obtained on application to the City Engineer's office, Regina, Saskatchewan.

A. J. McPHERSON, C.E., Consulting Engineer.
A. E. CHIVERS, City Clerk.

Regina, Sask., May 7th, 1910. 21

Tenders

University of Toronto Central Light Heat and Power Plant

Tenders will be received in triplicate by the undersigned up till noon, MONDAY, THE 23RD INST., for the furnishing and installing all heating and electrical apparatus, constructing tunnels, etc., required for the Central Light, Heat and Power Plant.

Plans and specifications for the entire work may be seen at the office of the architects.

The lowest or any tender not necessarily accepted.

DARLING & PEARSON,
2 Leader Lane, Toronto.

20

City of Regina

Province of Saskatchewan

Sewage Disposal Works

Sealed tenders will be received until noon, MONDAY, JUNE 6TH, 1910, for the construction of Sewage Disposal Works for the City of Regina. Tenders must be accompanied by an accepted bank cheque or other satisfactory deposit for the amount of $5,000.

The deposits of unsuccessful tenderers will be returned as soon as the contract is signed.

The right to reject any or all tenders or to waive any irregularities therein is to be at the discretion of the City authorities.

Plans, specifications, forms of tender and all information may be obtained on application to the City Engineer's office, Regina.

A. J. McPHERSON, C.E., Consulting Engineer.
A. E. CHIVERS, City Clerk.

Regina, Sask., May 12th, 1910, 22

Tenders for

Sea Wall Construction

Tenders, addressed to the undersigned, will be received by registered post only, up to 12 o'clock noon on TUESDAY, MAY 24TH, 1910, for the construction of a permanent Sea Wall along a portion of the cribwork in front of Exhibition Park.

Specifications may be seen and form of tender obtained, together with all information relative thereto, at the office of the Parks Department, City Hall, Toronto.

The usual conditions pertaining to tendering, as prescribed by city by-law, must be strictly complied with, and envelopes containing tenders must be plainly marked on the outside as to contents.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman of the Board of Control

City Hall, Toronto, May 11th, 1910. 20

Bridge Tenders

Sealed tenders will be received by Wm. Purves, Township Clerk, Columbus, Ont., up to noon, on SATURDAY, MAY 28TH, for the construction of Two Reinforced Concrete Bridge of 32 feet and 22 feet spans, near Oshawa.

Plans and specifications may be seen and information obtained from the Clerk, or from Hiram Gifford, Reeve of East Whitby, Cedardale, or from the engineers,

BOWMAN AND CONNOR,
20 36 Toronto street, Toronto.

COMPETITIVE PLANS

Competitive working sketches will be received by the undersigned up to and including MAY 28TH NEXT, for a four-roomed brick public school building with modern conveniences.

It is desired that the building be so planned that additional accommodation may be conveniently added to it when circumstances demand. Address

THOS. I. TRUEMAN,
Secy.-Treas. Public School Board,
20 Midland, Ontario.

Tenders for Paving

The City of Saint John Invites Tenders for

Paving, etc., in Main, Pond, Smythe, Nelson and St. John streets, according to plans and specifications to be seen and forms of tender obtained at the office of the City Engineer, Room No. 5, City Hall, duplicates of which are on file in the office of the "Contract Record," 504 Confederation Life Building, Toronto.

A cash deposit must accompany each bid, the amount being as stated in each specification.

The city does not bind itself to accept the lowest or any tender.

All tenders must be addressed to the Common Clerk, Room No. 3, City Hall, who will receive bids until noon of TUESDAY, THE 31ST DAY OF MAY, A.D. 1910.

ADAM MACINTYRE, Comptroller.
WM. MURDOCH, City Engineer.

St. John, N.B., May 7th, 1910. 21

Tenders For

Crushing Stone

Sealed tenders addressed to the undersigned and endorsed "Tender for Stone" will be received up to 12 o'clock noon, on MONDAY, MAY 30TH, 1910, for crushing and delivering on the road about 4,000 cubic yards of stone, the contractor to provide all necessary machinery, etc. The stone for crushing may be obtained along the West Branch of the Humber River on lot No. 6 in the 8th concession, and lots Nos. 7 and 8 in the 9th concession of the Township of Toronto Gore. The road to be improved is the 9th Line (Gore Road), in said township, commencing at the county line between Peel and York, and extending northerly. The tenders will be opened at the office of the Clerk of the County of Peel, Brampton, at 2 p.m. on the above date.

For further particulars apply to the undersigned.

The lowest or any tender not necessarily accepted.

[illegible]
[illegible]
21 [illegible]

City of Westmount

Street Paving

Tenders are invited for paving of Sherbrooke, St. Ctaherine and Selby Streets, Metcalfe and Wood Avenues, Cote St. Antoine Road, and other streets and avenues, in asphalt, scoria block, bitulithic or other permanent material, as stated in specifications and details now open to inspection by all interested at the office of the City Surveyor in the City Hall.

Tenders must be enclosed in sealed envelopes plainly marked "TENDER FOR PAVING" and filed with the undersigned not later than WEDNESDAY, THE 25TH MAY, INSTANT, 1910, at noon.

The Council does not bind itself to accept the lowest or any other tender.

Given at Westmount this 13th day May, 1910.

A. D. SHIBLEY,
20 City Clerk

NOTICE

In conformance with the Patent Act, and particularly Section 38, with reference to Canadian Patents Numbers 99,175 and 105,824, owned by the Diament Brikett Works, for improvements in the Manufacture of Briquets, the public are hereby notified that the article protected under the said patents is being manufactured and may be obtained from The Silicate Brick Company of Ottawa, Limited, and that inquiries for the supply of the article in quantities, for licenses to manufacture or other negotiations in regard to the Patent Rights may be made to the undersigned.

BLACKMORE, COTE & COMPANY,
Patent Solicitors and Experts,
20 114½ Yonge St., Toronto, Ont.

City of Prince Albert

Tenders

Sealed tenders addressed to the undersigned and marked "Tenders for Extensions" will be received until noon on SATURDAY, THE 21ST DAY OF MAY, 1910, for the construction of extensions to the water and sewerage systems of the City of Prince Albert, comprising approximately the following work:—

4,585	Lineal Feet 10-inch Water Main.
984	Lineal Feet 8-inch Water Main.
3.395	Lineal Feet 6-inch Water Main.
[illegible]	[illegible] Special Castings.
19	Valves.
13	Hydrants.
535	Lineal Feet 24-inch Storm Sewer,
667	Lineal Feet 18-inch Storm Sewer.
580	Lineal Feet 8-inch Storm Sewer.
3,056	Lineal Feet 8-inch Sanitary Sewer.
13	Man Holes.
1	Flush Tank.
1	Lamp Hole.
16	Catch Basins.

Plans and specifications may be seen and forms of tender obtained at the office of the City Engineer of the City of Prince Albert after May [illegible] 1910.

C. O. DAVIDSON,
City Clerk.

Dated at Prince Albert, April 27th, 1910. 20

Positions Vacant

[illegible]

[illegible]

WANTED—TRAVELLING SALESMAN to represent firm manufacturing bank, office and [illegible] fittings. Must be competent to make sketches, etc. Man having experience in architectural [illegible] preferred. Apply Box [illegible] "Contract Record," Toronto. TF

TOWN OF PRESCOTT

Sewer Construction

Sealed tenders will be received by the undersigned up to noon of SATURDAY, MAY THE 21ST, 1910, for the construction of "Sewers, Septic Tank and Outlet" in connection with the sewerage system of the Town of Prescott.

Plans and specifications may be seen and forms of tender obtained at the office of the Town Clerk, Prescott, or at the office of Morris and Moore, Pembroke, after Monday, the 9th day of May, 1910.

Tenders must be made on forms supplied, signed and sealed, and marked on outside "Tender for Prescott Sewer," accompanied by an accepted cheque for one thousand dollars on a chartered bank of Canada, made payable to the Town Treasurer of the Town of Prescott.

F. W. ELLIOTT,
Chairman Sewerage Committee,
20 Prescott, Ont.

Positions Wanted

[illegible]

WANTED POSITION AS SUPERINTENDENT, to take charge of concrete or railway construction work. I am thoroughly experienced in this line of work. Address, Box 978, "Contract Record," Toronto, Ont.

Miscellaneous

[illegible]

AGENTS WANTED—United States manufacturers of a well-known waterproofing compound wish to get in touch with reliable firm or individual to represent them in Canada. This would be a desirable opportunity for an energetic young architect or engineer. Box 970 "Contract Record." 20

FOR SALE CHEAP—One hundred thousand feet, well-seasoned white pine timber, part old Gilmour Mill; six thousand feet cedar; eleven thousand feet hemlock; four hundred feet white oak; all in various sizes, six to sixteen inches, and lengths, six to thirty feet. For particulars apply—F. W. ARMSTRONG, Trenton, Ont. 21

New Companies

Belding Lumber Company, Limited, Toronto, Ont., capital $40,000. Incorporators, John Cowan and Thos. W. Best, both of Toronto, Ont.

The Granville Power Company, Limited, Ottawa, Ont., capital $1,500,000. Incorporators, Francis H. Chrysler, and Chas. J. Bethune, solicitors, both of Ottawa, Ont.

Dominion Pacific Lumber Company, Limited, Montreal, Que., capital $3,500,000. Incorporators, Henry A. Lovett; K.C., and Geo. V. Cousins, acountant, both of Montreal, Que.

Shurly, Dietrich Company, Limited, Galt, Ont., capital $350,000. Incorporated to manufacture, sell and deal in saw, mechanics' tools, machinery, etc. Incorporators, J. C. Dietrich, manufacturer, and John Turnbull, machinist, both of Galt, Ont.

It was erroneously reported in our issue of May 11th that Messrs. Byers & Anglin, general contractors, 18 St. Alexis street, Montreal, had dissolvel. As a matter of fact the firm was being [illegible] by the admission of Mr. C. H. Harrington, B.Sc., son of the late Professor Harrington, of McGill University. Mr. Harrington was for some time connected with the offices of Messrs. Byers & Anglin and latterly has been in the employ of the Eastern Concrete [illegible] Company of [illegible]. The firm will be known as Messrs. Byers & Anglin.

Power Plants, Electricity and Telephones

Continued from page 29

[illegible] of an electric light plant will shortly be introduced.

Moncton, N.B.

The agreement drafted by the city and the street railway provides that the construction of the street railway will commence on or before March 26th, 1911. This will be submitted to the ratepayers on May 11th.

New Hamburg, Ont.

The ratepayers will shortly vote on a by-law to purchase an electric light plant.

Regina, Sask.

The ratepayers have given a mandate to the city council to immediately proceed with the construction of a street railway to be operated by the municipality.

Renfrew, Ont.

A by-law will be submitted to the ratepayers on the 21st inst. for $82,000 30-year debentures for the purchase of water powers, which will be developed.

Vernon, B.C.

A company in which Vancouver capital will be largely represented is now being formed for the purpose of establishing a large electric lighting and power plant in the upper Okanagan valley. It is stated that plans have been so far matured that incorporation of the company will be completed at an early date. The principal business of the new company will be the construction and operation of lines of electric railway which, acording to present plans, will radiate from the town of Vernon.

Vancouver, B.C.

The Western Canada Power Company will construct an eight-mile railway, which will be operated in conjunction with their new power plant at Stave Falls. A small electrical unit will be ready in a few days to furnish power for this railway.

Waterville, Que.

Plans have been completed for the development of a water power on the Coaticook river about a mile below here. Of this, 250 horse power will be required to operate the factory of Geo. Gale & Sons, and the company will also light Compton as well as this place. F. C .Davis, connected with the Hydro-Electric plant for the town of Coaticook, is the engineer in charge.

Welland, Ont.

The ratepayers will vote on a street railway franchise on June 20th; also on a $5,000 fire alarm system.

AWARDED.

Victoria, B.C.

The telephone and light committee recommended that the contract for the conduit system to be laid on Douglas street be awarded to the B. C. Electric Construction Company, of Vancouver, and the contract for the necessary electric wiring to Messrs. Hutchison Bros., of this city.

Winnipeg, Man.

M. Peterson, secretary, Board of Control, sends us the following items. Contracts have been awarded as follows: Section A.—Comprising three 50-light regulators and control panels, also one hundred arc lamps, 6.6 ampere magnetite system, Canadian General Electric Company, Winnipeg, at $9,190. Section B.—Insulated line wire and cable, The Northern Electric and Manufacturing Company, Winnipeg, at $2,010.75. Section C.—Mast Arm Parts, The Northern Electric and Manufacturing Company, Winnipeg, at $258.21. Section D. Six panel Switchboard, instruments, etc., The Canadian General Electric Company, Winnipeg, at $3,450.

Miscellaneous

Castlemore, Ont.

Tenders are being called until May 30th for crushing and delivering on road about 4,000 cubic yards of stone. See advertisement in this issue.

Ottawa, Ont.

Tenders are being called until May 23rd by the Public Works Department, for dredging required at the following places in Ontario: Five Miles Narrows, Spanish River and Welland River.

Tenders addressed to L. K. Jones, secretary, Department of Railways and Canals, will be received until May 26th for the widening of the canal near Welland, Ont. Plans, etc., at office of Chief Engineer of the above department, and at the office of the Superintending Engineer, St. Catharines, Ont.

Recent building permits include: J. J. Anderson, concrete office and warehouse, Wellington street, $2,500; Frank Barnes, brick veneer dwelling, Sunnyside avenue, $2,500; Public School Board, two brick schools, Hopewell and Breeze Hill avenues, $49,000 each; A. McArthur, brick dwelling, Woodlawn avenue, $3,500; Wm. Fields, brick veneer dwelling, Osgoode street, $2,500; Wm. P. Davis, alterations and addition to dwelling, Wilbrod street, $15,000; St. Paul's Presbyterian Church, stone dwelling for manse, $10,500; J. McFarlane, row of five brick veneer dwellings, Flora street, $6,000.

Port Arthur, Ont.

Tenders addressed to J. McTeigue, city clerk, will be received until May 21st for street sweeper. Tenderers will please quote upon a hickory broom, rattan and steel sweeper with weight and capacity.

Toronto, Ont.

Tenders are being received until May 24 for construtcion of sea wall, etc. See advertisement in this issue.

Winnipeg, Man.

Recent building permits include: J. Johnson, two houses on the north side of Merrion, $4,000; W. Moxam, apartment block, corner of Spadina and Joseph, $50,000; D. B. Watt, house, Ashburn, $3,500; Richard H. Cole, house, Nasau and Kylemore, $3,300; McLean & Grisdale, two houses, Cathedral, $2,500 each; The Logberg Printing Company, an apartment and stores building, $35,000; McLean & Grisdale, two houses, Cathedral avenue, $4,800; G. B. Watt, house, Ashburn, $3,500; R. H. Cole, house, southeast corner Nasau and Cairnmore, $3,300; W. Shaw, house on the west side of Home, between Buell and Preston, $3,000; A. J. Carson, house on the north side of Cathedral, between Mac and Scotia, $2,500; Arni Eggertson, three houses, McMillan avenue, $13,500; Arni Eggertson, two houses, Burnell, $6,000; H. Haldorson, dwelling, Simcoe street, $5,000; Dunn and Wallace, house, Grosvenor street, $5,000; Riverview Presbyterian Church, extension, $2,600; Taylor Webb, house, Nassau street, stone and concrete, $11,000; Albert Johnson, apartment block, east side of Sherbrooke street, Paul M. Clemens, architect; twenty suites, three storeys and basement, 46 by 90 feet, $45,000; Smith & Kirkpatrick, two houses, south side of Buell avenue, $9,200; H. Sandison, house, 412 Assiniboine avenue, $5,000; J. Ryan, Jr., house, southeast corner Central avenue and Blanchard street, $10,000; W. L. Ball, house, Wellington Crescent, $15,000; Ed. Noe, house, west side of Lilac street, $10,000; G. A. Beliveau, house, south side of Harvard avenue, $10,000.

AWARDED.

Minnedosa, Man.

The contract for the building of the dam on the Little Saskatchewan river has been awarded to Snyder Bros., of Portage la Prairie, $40,528.

Montreal, Que.

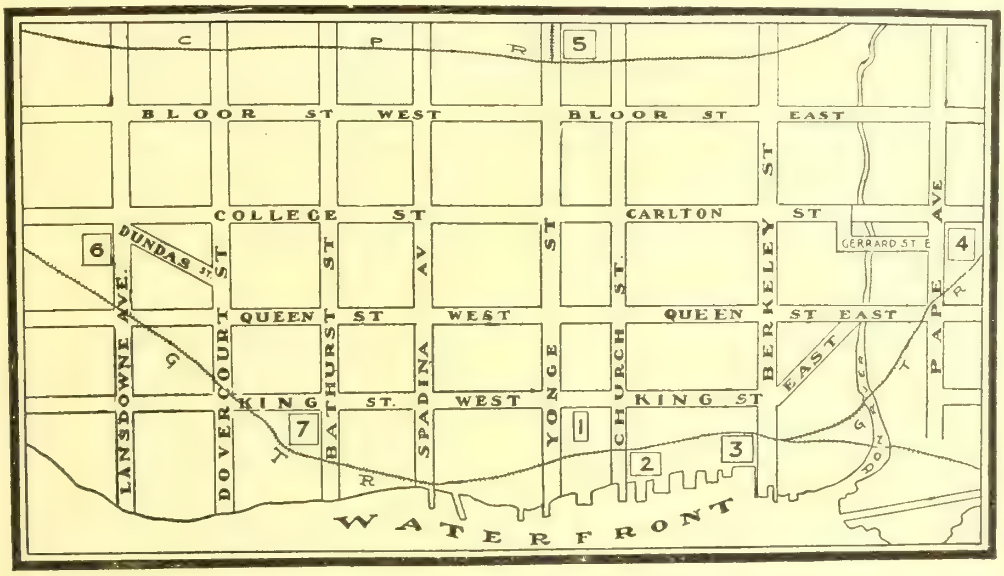
Recent building permits include the following: W. Larose, 237 St. Christophe Colombe, two houses containing six dwellings, $6,000; Tees & Company, 912 St. Catherine west, one stable, $5,000; H. T. LaPointe, 173 Plessis, four houses containing ten dwellings, $10,000; N. Ethier, St. Denis street, one house containing two dwellings, $12,000; J. Menard, 164 Beaudoin, two houses containing four dwellings, $3,000; D. Rippel, 527 Rachel, two houses containing six dwellings, $8,000; J. Creviere, 33 Laurier avenue west, two houses containing four dwellings, $7,000; J. R. Dagenais, 374 Marquette, two houses containing four dwellings, $4,000; Protestant School Commissioners, Peel street, one house and one school, $80,000; L. J. P. Desauliners, 1427 Papineau, one house containing five dwellings, $4,000; L. J. St. Pierre, 261 St. Germaine, one house containing two dwellings and one store, $5,500; J. B. Lefleur, 71 Laurier avenue, two houses containing six dwellings, $6,000; A. Comiere, 19 Laurier avenue, two houses containing six dwellings, $8,000; W. L. Haldimand, 444 Argyle avenue, one house containing three stores, $4,000; A. Menard, 241 Stadacona, one house containing three dwellings, $3,000; W. Fournier, 2677 Esplanade, two houses containing four dwellings, $3,000; O. Martineau & Fils, Limited, 371 Marie Ann avenue, seven houses containing twenty dwellings and one store, $21,000; V. Martineau, 725 St. Catherine east, one house containing three dwellings, $6,000; L. R. Montbriant, 230 St. Andre, one house containing seven dwellings, $6,000; Dominion Oilcloth Company, 1192 St. Catherine east, one house and one warehouse, $80,000; A. Lapointe, 812 Demontigny, one house containing three dwellings, $2,500; L. F. Gingras, Ste. Rose, Que., two houses containing six dwelings, $2,500; E. Plaudin, 1808 Boyer street, one house containing three dwellings, $3,800; F. Dendron, 545 Chausse, three houses containing nine dwellings, $6,000; Z. Berard, 88a Gaspe, five houses containing fifteen dwellings, $12,500; Z. Berard, 88a Gaspe, four houses containing twelve dwellings and one store, $10,000; H. Paiemont & Company, 80 St. Gabriel, four houses containing twenty-four dwellings, $15,000; Z. Aubertin, 80 St. Gabriel, three houses containing eighteen dwellings, $12,000; F. W. Cross, St. Catherine west, alterations to one house and one store, $6,000; Mad. L. Huot, Beloeil, Que., alterations to one house, two dwellings and two stores, $4,000; Mrs. Dr. Ritchie, Bishop street, alterations to one house and three dwellings, $4,500; R. H. Bryson, 501 St. Catherine west, alterations to one house, $7,000; J. W. Cooper, Oliver avenue, Westmount, alterations to one house, $3,200; Successors Emery Lavigne, 176 Mance street, alterations to two houses, six dwellings and two stores, $2,700.

Toronto, Ont.

Messrs. J. & J. Taylor have received the contract for the installation of treasury and safety deposit vaults for the Toronto General Trusts Corporation. The same firm has been awarded a similar contract for the Bank of Montreal at Winnipeg. These contracts are said to comprise the two largest vault equipments in Canada.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards



Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is

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Bridge, Structural and Mining Timbers

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We have a Large and Complete Stock of :

Scrapers (Wheel and Drag)

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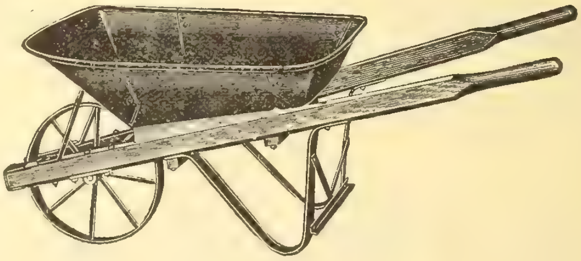
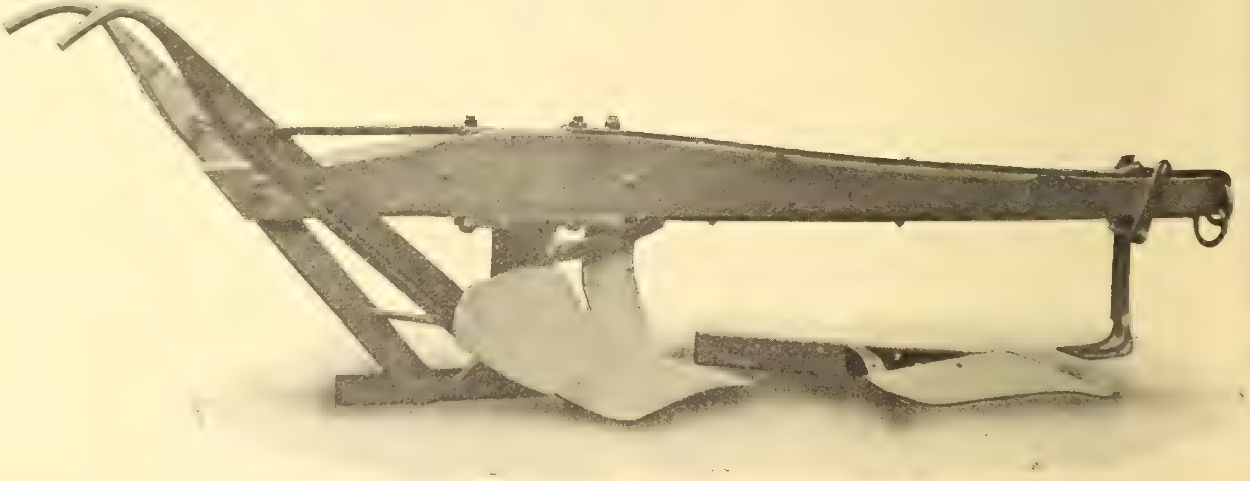
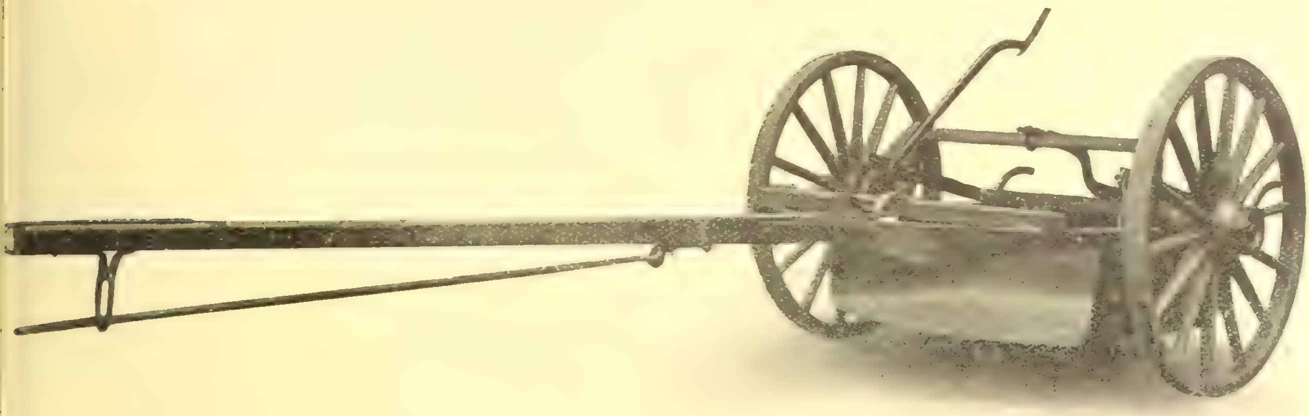
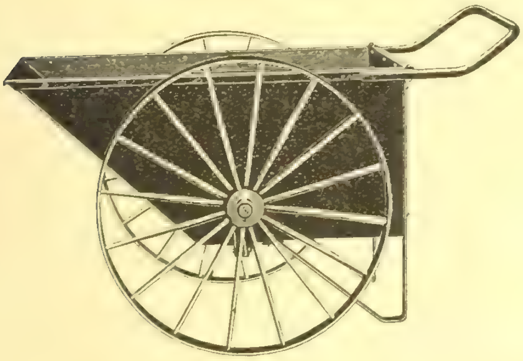


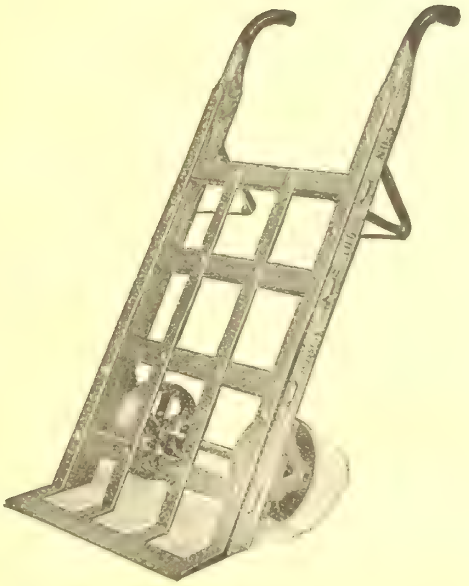


Head Offices and Warehouses :
Montreal

MUSSEN







us figure with you also on your heavy equipment if you are in the market for Steam Shovels, Rock Crushers, Hoisting Engines, Derricks, Excavating Buckets, Concrete Mixers, Concrete Hoists, Concrete Buckets, etc., etc.

LIMITED

BRANCHES:

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Cobalt, Opp. Right of Way Mine
Winnipeg - 259-261 Stanley St.
Calgary - - Crown Block
Vancouver - - Mercantile Bldg

Glidden's Concrete Floor Dressing

This material is especially intended for the maintenance of concrete floors, protecting same against abrasion and wear, the natural consequence of which is dust formation; also protection against the absorption of moisture, oil, grease and disease germs. This material knits down close to the surface, forming a hard coating, which becomes integral with the concrete.

This material is made in light and dark drab shades, terra cotta and tan color. Also white and transparent.

Two coats are required to obtain a satisfactory result, while with three a most excellent finish is produced. It also has the desirable feature of reducing vibration, producing a soft, easy tread.

We strongly recommend the use of this material upon hospital and school work, as the danger from inhaling the dust of abrasion of a cement surface is self-evident.

Covers 200 to 300 square feet to gallon first coat, 300 to 400 square feet to gallon second coat, according to surface.

Specifications.

Have the surface over which it is to be applied thoroughly dry, clean and free from dust. grease and dirt, The contents of the package should be stirred well before applying. Spread the Dressing uniformly over the surface by means of a suitable brush, working same well into the concrete. Where two or more coats are to be applied, about 36 to 48 hours should be allowed between coats, under favorable weather and temperature conditions, and under no circumstances should one coat be applied over another, unless same is thoroughly dry and hard.

Over new work the first coat will cover about 200 to 300 square feet to the gallon, while the second coat will cover 300 to 400 square feet, to the gallon, according to the condition of the surface.

THE GLIDDEN VARNISH COMPANY, Cleveland, Ohio

Distributed in Canada by

Stinson-Reeb Builders Supply Company Eastern Townships Bank Building
Montreal, Quebec

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THE NORTHERN ELECTRIC AND MFG. CO. LIMITED
TELEPHONES ARC LAMPS

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ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

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Vol. 24 Toronto May 18, 1910 No. 20

Building Materials and the Outlook for Business

The present season is one of the most promising Canada has ever experienced at this time of the year. A feature is the immense amount of work coming out on all sides. In the west, as in the east, there are one or two disagreeable factors, the most noteworthy of these, of course, being the shortage of building materials, and the labor problem. The shortage of brick is the worst trouble. From Winnipeg comes the same tale that is heard at Toronto, namely, that the situation will not be relieved until the brick yards have their first burn on the market.

At Toronto, No. 1 dry pressed brick brings from $15 to $18. Red face brick sells at about $12. Grey stock brick is scarce at $10. Hard foundation and sewer brick range from $10 to $11. These are the prices obtaining upon the available supply. The great difficulty is to fill orders at all. It is a matter for speculation whether there will be any material reduction with the first output of the kilns, particularly in view of the great amount of work in sight. There is a good supply of cement on hand at Toronto, with prices unchanged as quoted by this journal.

Our Winnipeg correspondent states that in the western section there is a stiffening tendency in all materials, notably brick, lumber and cement. The stocks of lumber in Saskatchewan and Alberta are reported to be smaller than they have been for several years, and the British Columbia mills, therefore, are practically assured of a big demand.

A negotiable factor in the general business outlook is the amount of railway construction planned. This will put a great deal of money into circulation. Notwithstanding the activity of trade there is every probability that money will continue to be comparatively easy and that capital will be available for legitimate enterprises at reasonable rates.

It is a matter of satisfaction that the crop reports from the West are very encouraging. The early opening of spring and of seeding marked the beginning of a season of particular activity. The agricultural community, generally, is in a sound financial condition, the proceeds of last year's crop having sufficed to liquidate practically all their old liabilities. These circumstances are exceptionally favorable to the building outlook.

Should Creed Enter Into Contract Matters?

The Public School Board at Ottawa is laying itself open to criticism for turning down certain tenderers because they were not public school supporters. Tenders were called for the new schools on Hopewell and Breeze Hill avenues. The lowest bid received for one of the contracts was submitted by a reputable firm, one member of which was a public and the other a separate school supporter. The contract was awarded to the next lowest tenderer on the ground that the money should be spent with public school supporters.

Whatever particular arguments may be adduced in favor of this particular award, we do not believe in petty discriminations of this kind. Once a man has been permitted to tender and has shown himself financially capable of carrying out the work, his chances should be absolutely on a par with other tenderers—neither better nor worse—color, creed and politics notwithstanding. If the Ottawa School Board or any other public body wants to discriminate, let the discrimination be made in the advertised calls for tenders, so that people will know where they are at.

The spirit in which tenders should be called is shown in a letter just to hand from Mr. F. L. Fellowes, City Surveyor of Westmount. The following is an extract:

"This city is calling for tenders for the construction of about 100,000 yards of asphalt paving, of the usual standard and we shall be pleased to receive bids. The work will be let to any reputable tenderer with the lowest price. Every opportunity will be afforded for satisfactory figuring. Contractors are invited to communicate with this office."

No objection can be taken to the power of veto furnished by the clause: "The lowest or any tender not necessarily accepted." Obviously, it is only fair for the parties who invite tenders to have some freedom of action. Contractors, however, often express themselves strongly as to the way in which the freedom thus reserved is used. In practically every case the object of taking tenders is, ostensibly at least, to obtain the lowest bid for the work; and it is only reasonable to infer that the lowest tender will be accepted if the work is carried out. Consequently, those who tender exercise their utmost ingenuity in order to submit the lowest price. In this process, nowadays, much time is spent and much experience brought to bear. It is therefore, very annoying for a firm to find that although they have come out lowest in the competition, a tender at a higher rate has been preferred. Generally, the inferences in such a case are that the firm quoting the lowest price is incompetent or financially inadequate to the work; or that it was intended from the first to give the job to a certain firm and the tenders of others were invited merely as a check. But occasionally, as at Ottawa, the firm quoting the lowest price is in some way objectionable.

Financial inadequacy or incompetence are generally sound reasons for rejection. As to the unfairness of inviting tenders from a number of firms merely as a check price on some favored concern to whom the work is to be given if their price is anywhere near the mark, there can be no two opinions. If the fact becomes known, and it not infrequently does, that a certain firm is to be preferred the competition is nothing less than a farce played at the expense of its promoters. When, however, tenders are taken publicly and the lowest bid is rejected owing to a *difference in creed*, it is time for comment. 'Creed indeed!' Is there any morality in inviting tenders with no intention of giving the work to the best man?"

The unsavory reputation which the Ottawa Public School Board will enjoy in contracting circles should point a moral to municipalities and others who are handling really important work.

Architects and the Public

Mr. W. Shaw Sparrow, in the "New Age," has a tilt at architects in their relationship to the community.

The knowledge Mr. Sparrow has of the problems before the architect at the present time, points his lance and renders his thrusts the shrewder. Witness his remarks as follows:

> "Unhappily, too, architects are unable to protect themselves. Union is the last necessity that artists think about. They look at things from so many points of view that they talk and wrangle far too much, till their energy for action becomes as futile as evaporated steam. Then they say, 'We're artists, individualists.' A moment later, having forgotten that remark, they add, 'We haven't a chance; there are so many forces against us.' Just so. The unorganized go down before the charging big battalions. As authors fear publishers, yet never set on foot a publishing firm of their own, so architects, despite their poor hopes for the future, with practical courage the tactics of competing shop comneither become their own contractors nor try to encounter panies bolstered up by advertisements. Odd and pathetic! Why is it that artists cannot produce a strategist, a great organizer, their own Lord Kitchener?"

Architecturally Treating Stone Work

The architectural treatment of stone work is a subject to which architects do not appear to have given as much attention in all cases as its importance would seem to warrant, but in a public address some time ago, an English architect, W. J. Hale, of Sheffield, offered some suggestions which are of interest along this line. Among other things he said:

Two characteristics which make stone useful as a building material are its weight and its power to resist a crushing force. One of the charms of stonework lies in its capacity to receive the impress of the individual man's power and thought. Its surface can be made to reflect his mind by the manual labor he expends upon it, and the monotony of a modelled and cast material is avoided. Although stone is granular, it is generally more or less laminated, and care should be taken to place the blocks in the building so that the edges only may be exposed to the weather, otherwise the stone will more easily decay and the surface peel off. Jointings should be carefully considered, acute angles avoided and right angles used where possible.

The arch utilizes in its shape and design the prominent characteristics of stone, its weight and its power to resist crushing force, and the introduction of this feature causes one of the greatest changes in architecture. A further development of the arch is the groined or vaulted ceiling, which relies for stability upon the same qualities, and has also certain fire-resisting powers. One method of beautifying the stone is by mouldings, i.e., the working of surfaces or edges of the stone with ridges and hollows of various forms, in order to obtain parallel lines of light and shadow, and, as a variety is the object here, it is well to get variety also in the size of the light and dark stripes.

One of the problems of the day with regard to architecture in stone is the modern street front. Surely the craze for carrying tons of stone on sheets of plate glass has gone far enough. Any building, to be satisfactory, must not only have supports strong enough to carry the superimposed weight, but the supports must look strong enough for their burden. Any treatment of stone should, in the first place, be examined as to whether or not it takes advantage of the inherent qualities of the material, and secondly, as to whether it satisfies man's trained artistic perceptions. If he stands these tests, then, although the particular feature may not be capable of defence on strictly utilitarian grounds, still it has justified its existence.

A Method of Numbering Drawings

In order to number drawings in a convenient manner and make it easy to find any section or detail referred to on an assembled drawing or plan, Mr. I. W. Jones, engineer and designer of water power plants, Milton, N.H., has devised a system which is self referencing.

The various sheets for a given job are designated alphabetically, from A onward. When there are more than 26 sheets on one job, the 27th is called AA, the 28th AB, and so on. The different views, sketches and details on a sheet are designated numerically and the sheet letter attached to the number. For example, the third detail on sheet D would have as its title, No. 3—D. When sections are taken they are given titles which show the letter of the sheet on which they are detailed, and a number corresponding to the position on that sheet. If, for example, a certain cross-section line on one of the plans is marked 2—H, it means that the drawing of this section will be found on sheet H and that it is the second section or detail on that sheet. All section lines are lettered at both ends and have arrows to show in what direction the section is taken. Moreover, if a piece of machinery indicated on a plan is marked "See Detail 9—M," it would mean that the detailed drawing of the object is No. 9 on sheet M. The scheme thus saves considerable time over one that is not self referencing. Mr. Jones states that it has been found very satisfactory.

Each job is given an individual number which consists of a combination of a consecutive job number for the year in which it was taken, and the last two figures of the year. For example, job number 1009, means that the job was the tenth one taken up in 1909, while the 25th started in that year would be numbered 2509. By this method both plans and files indicate at a glance when a given piece of work was taken up.

Illustrating the manner in which contract matters were carried out under the last administration at Montreal, it transpires that no contract was made for the erection of the new city morgue on Craig street. Mr. L. J. Gauthier, advocate, appeared before the Board of Control last week and asked that the contract be signed Asked why the council had not dealt with the matter, he told the controllers that it cost so much to get the project through the Hygiene Committee that it was not deemed advisable to press things before the city council. It is almost incredible that such a state of affairs could have existed.

Don't cut prices; anybody can do that. Do better work!

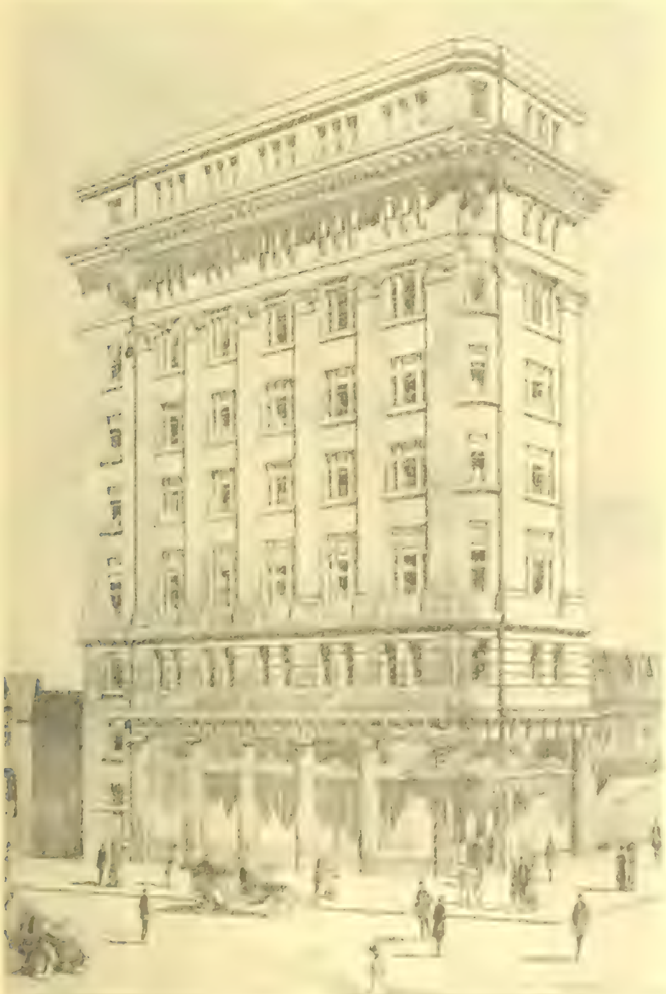
An Example of Up-to-date Store Design

The Willis Building Montreal—Character and Purpose of Structure expressed in Architectural Treatment Features of Construction

Architects: Ross & MacFarlane, Montreal

The new building which is to be erected on the southwest corner of St. Catherine and Drummond streets, Montreal, contains meritorious suggestions in the design and construction of modern store buildings that are of interest to both architects and contractors.

The structure is to be erected on the site of the premises now occupied by Mr. J. A. Harte's drug store. It will be occupied exclusively by the owners for their own business, their present premises being both inadequate and unsuitable for their demands. The first, or street floor, will be used as a general reception floor and showroom, toward the rear of which a Mezzanine floor will be provided for the sales department. At the rear of the store and approached by a separate side entrance on Drummond street, will be situated the passenger elevator, communicating with the general and directors' offices on the second floor; with the concert hall on the third floor; with the parlor and show rooms on the fourth and fifth floors; with a sales room on the sixth floor; with the repair and polishing rooms on the seventh floor, and with the janitor's apartments and store rooms on the eighth floor.



Perspective view of new Willis Building, Montreal, as the structure will appear on completion

The shipping and packing rooms, also storage, will be accommodated in the basement, and the heating apparatus, elevator and vacuum cleaning machinery in the sub-basement. The stairs and freight elevator are in the rear of the building, communicating with each of the several floors mentioned above.

The building was designed by Messrs. Ross & MacFarlane, and will be erected under their supervision. The structure will rest upon concrete foundations carried down to the rock, and will be built of fireproof materials throughout, the framing consisting of fireproofed steel and the floors of reinforced concrete. The exterior will be carried out in gray limestone. On the principal showroom floor the maximum area of glass has been provided for display purposes. The interior finish of this floor will be decorated in harmony with the character of a piano business. Every effort has been made to express the character and purpose of the building in every detail of construction and decoration.

A Canon of Ethics for Architects

The following canon of ethics has been adopted by the American Institute of Architects as a general guide to members, and will be recognized as enumerating some of the elementary duties of an architect towards fellow professional men:

It is unprofessional for an architect

1. To engage, directly or indirectly, in any of the building trades.

2. To guarantee an estimate or contract by bond or otherwise.

3. To accept any commission or substantial service from a contractor or from any interested party other than the owner.

4. To advertise.

5. To take part in any competition the terms of which are not in harmony with the principles approved by the institute.

6. To attempt in any way, except as a duly authorized competitor, to secure work for which a competition is in progress.

7. To attempt to influence, either directly or indirectly, the award of a competition in which he is a competitor.

8. To accept the commission to do the work for which a competition has been instituted if he has acted in an advisory capacity either in drawing programme or making award.

9. To injure falsely or maliciously the professional reputation, prospects, or business of a fellow architect.

10. To undertake a commission while the just claim of another architect who has previously undertaken it remains unsatisfied, or until such claim has been referred to arbitration or issue has been joined at law.

11. To attempt to supplant a fellow architect after definite steps have been taken toward his employment.

12. To compete knowingly with a fellow architect for employment on the basis of professional charges.

The Standard Ideal Company, Limited, have removed from 128 Craig street west to 155 Notre Dame street west, Montreal.

Construction of a Concrete Water Tower

At Victoria, B.C.—Details of Methods Employed by Contractors Itemized Costs—Factors which Contributed to Extra Expense*

By A. Kempkey

The tower, as built, consists of a hollow cylinder of plain concrete, 109 feet high, and having an inside diameter of 22 feet. The walls are 10 inches thick for the first 70 feet and 6 inches thick for the remaining 39 feet, and are ornamented with six pilasters (70 feet high, 3 feet wide, and 7 inches thick), a 4-foot belt, then 12 pilasters (12 feet high, 18 inches wide, and 7 inches thick), a cornice, and a parapet wall. A steel tank of the railway type is embedded in the upper 40 feet of this cylinder. To form the bottom of this tank, a plain concrete dome is thrown across the cylinder at a point about 70 feet from the base, the thrust of this dome being taken up by two steel rings, ½-inch by 14 inches and ⅜-inch by 18 inches, bedded into the walls of the tower, the latter ring being riveted to the lower course of the tank. The tank is covered with a roof of reinforced concrete, 4 inches thick, conical in shape, and reinforced with ½-inch twisted steel bars.

The tower is built on out-cropping, solid rock. This rock was roughly stepped, and a concrete sub-base built. This sub-base consists of a hollow ring, with an inside diameter of 20 feet, the walls being 5 feet thick. It is about 2 feet high on one side and 7 feet high on the other, and forms a level base on which the tower is built. The forms for this sub-base consisted of vertical lagging and circumferential ribs. The lagging is of double-dressed, 2x3-inch segments, and the ribs are of 2x12-inch segments, 6 feet long, lapping past one another and securely spiked together to form complete or partial circles. These ribs are spaced 2 feet centre to centre.

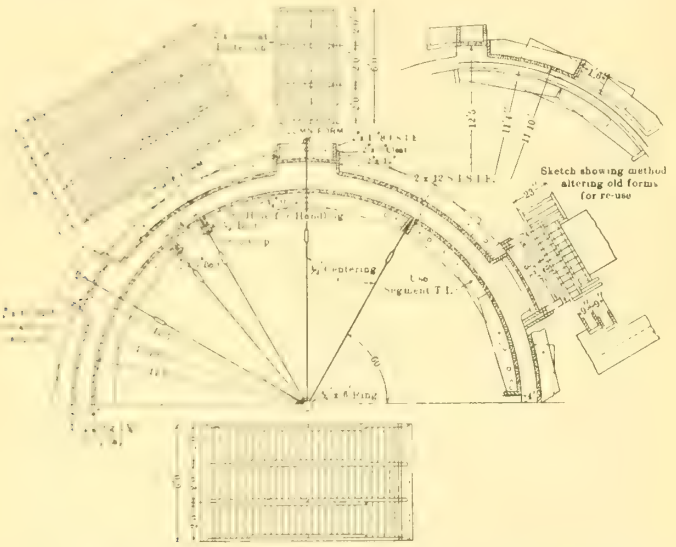


Fig. 1—Movable Form for Shaft of Concrete Water Tower

Similar construction was used to form the taper base of the tower proper, except, of course, that the radii of the segments forming the successive ribs decreased with the height of the rib. Tapered lagging was used, being made by double dressing 2x6-inch pieces to 1¾x5 3/16-inch, and ripping on a diagonal, thus making two staves, 3-inch wide at one end and 2¾-inch wide at the other. This tapered lagging was used again on the 4-foot belt and cornice forms, the taper being turned alternately up and down.

The interior diameter being uniform up to the bottom of the dome, collapsible forms were used from the beginning. These forms were constructed in six large sections, 6 feet high, with one small key section with wedge piece to facilitate stripping, as shown in fig. 1. There were three tiers of these, bolted end to end horizontally and to each other vertically.

Above the taper base and except in the 4-foot belt and cornice, collapsible forms were used on the outside also. There were six sections extending from column to column and six column sections, all bolted together circumferentially and constructed as shown in fig. 1. Three tiers of these were also bolted together both vertically and horizontally.

Having filled the top tier, the mode of operation was as follows: All horizontal bolts in the lower inside and outside forms were removed, as was also the small key section on the inside; this left each section suspended to the corresponding one immediately above it by the vertical bolts before mentioned. It is thus seen that in each case the centre tier performed the double duty of holding the upper tier, which was full of green concrete, and the sections of the lower tier, until they were hoisted up and again placed in position to be filled.

These lower forms were then hoisted by hand—four-part tackles being used—and placed in position on the top forms, their bottom edges being carefully set flush with the top edge of the form already in position, and then bolted to it. On the outside, the column forms, and on the inside, the wedge and key sections were set last. A 3-pound plumb-bob and a fine line were suspended from the inner scaffold and carefully centered over a point set in the rock at the base. This line was in the exact centre of the tower, and the tops of all the forms, after each shift, were carefully set from it by measurement, thus keeping the structure plumb.

The first 23 inches of the barrel of the tower were moulded with special outside forms, constructed so as to form the bases of the large pilasters. After eleven applications of the 6-foot forms, these 23-inch sections were reversed to form the capitals, thus making these pilasters 69 feet 10 inches over all.

The forms of the 4-foot belt and beading were made in twelve sections of simple segments and vertical lagging, as shown in fig. 1.

Two sets of the outside forms were split longitudinally, as shown in fig. 1 ,and used to form the small pilasters. The first set was put in place, filled, and the concrete allowed to harden. The bolts were loosened and the forms raised 5½ inches vertically, again bolted up, and the second set was placed in position, bringing the top of the second set up to the bottom of the cornice. The bases and capitals of the small pilasters were moulded on afterward.

The cornice forms are clearly shown in fig. 1. The small boxes separating the dentils are made of light stuff, and tacked into the cornice forms so that, in stripping, they would remain in place and could be taken out separately, in order to prevent the breaking off of the corners of the dentils. A number of outside and inside sections were sawed in half horizontally in order to provide forms for the parapet wall.

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*Abstracted from paper read before the American Society of Civil Engineers.

The inside diameter of the tank is 8 inches greater than the inside diameter of the base. Two sets of inside forms were split longitudinally and opened out as shown in fig. 1, and another small section was added to complete the circle. The remaining set was left in place to support the dome forms.

The dome forms were made in 12 sections, bolted together to facilitate stripping. All ribs and segments were cut to size on the ground, put together in place, and then covered with lagging and two-ply tar paper. The lagging on the lower sharp curve was formed of a double thickness of ⅜-inch spruce, the remainder being 1x4-inch pine, sized to a uniform thickness of ⅞-inch.

The roof forms were made in eight sections and bolted together to facilitate stripping. All ribs and segments were cut to size on the ground, put together in place, and covered with 1x4-inch lagging, dressed to a uniform thickness of ⅞-inch, and two-ply tar paper. The segments being put in horizontally instead of square with the lagging, gave circles instead of parabolas, making them much easier to lay out, and giving a form which was amply stiff.

The question of using an inside scaffold only was carefully considered, but owing to the considerable amount of ornamentation on the outside, necessitating a large number of individual forms, it was not thought that any economy would result. Fig. 2 shows clearly the construction of the scaffolding.

All concrete was mixed wet, in a motor-driven Smith mixer, and handled off the outside scaffold, being sent up in wheelbarrows on the ordinary contractor's hoist and placed in the forms through an iron chute having a hopper mouth. This chute was built in three sections bolted together, either one, two, or three sections being used, depending on the distance of the forms below the deck. When the top of the forms reached the elevation of any deck, the concrete was put in through the chute from the deck above. The chute was light and easily shifted by the wheelbarrow men, assisted by the man placing the concrete, during the interval between successive wheelbarrows.

The concrete, except that for the roof and parapet, was composed of sand and broken rock, the run of the crusher being used. That for the roof and parapet was composed of sand and gravel. The only reason for using gravel for the concrete of the roof was the ease with which it could be obtained in small quantities, the supply of broken rock having been used up, and this being the last concrete work to be done.

The concrete used was as follows: 1 : 3 : 6 for the sub-base and taper base; 1 : 3 : 5 for the barrel of the tower and tank casing; and 1 : 2 : 4 for the dome and roof. The dome was put in at one time, there being no joint, the same being true of the roof. Vancouver Portland cement, manufactured on the island about 15 miles from the city, was used throughout the work.

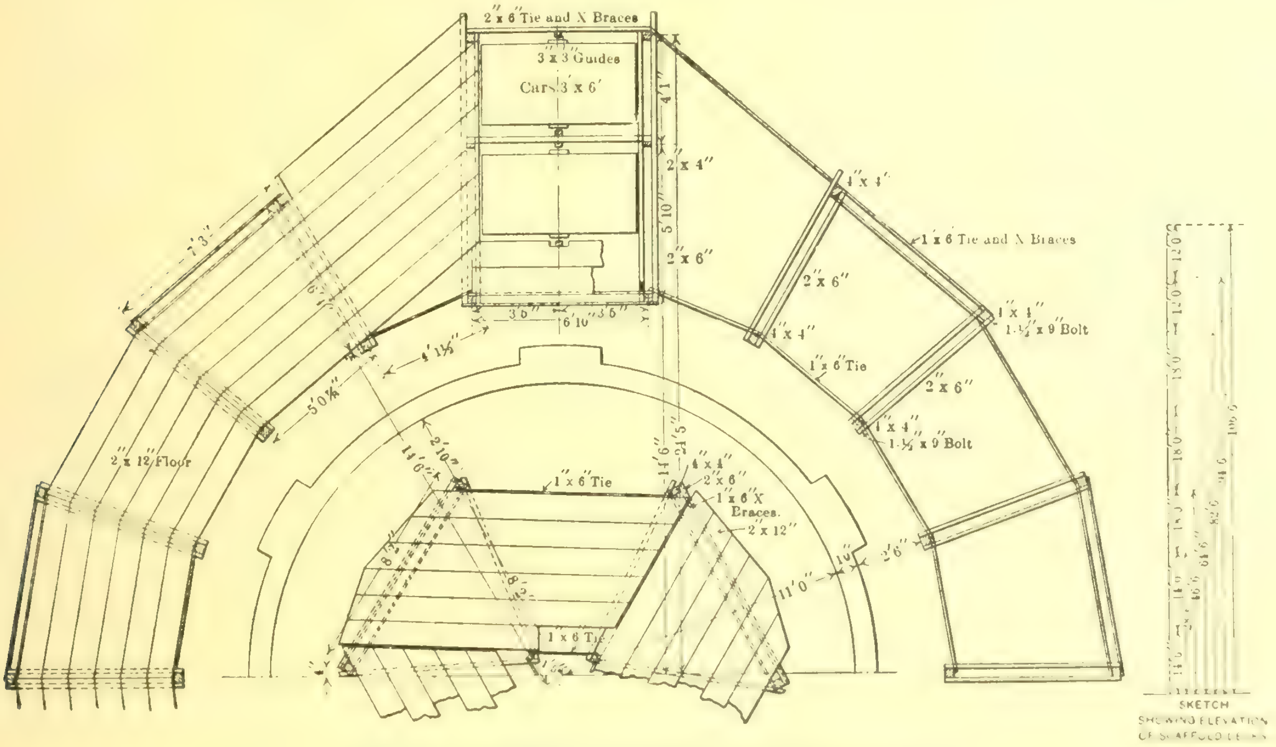


Fig. 2—Details of Scaffold for Constructing Concrete Water Tower

Before filling, the inside of the tank was given a plaster coat, consisting of 1 part cement to 1¾ parts of fine sand. This proved to be insufficient to prevent leakage, the water seeping through the dome and appearing on the outside of the structure along the line of the bottom of the rings. Three more coats were then applied over the entire tank, and two additional ones over the dome and about 8 feet up on the sides, and except for one or two small spots which show just a sign of moisture, the tank is perfectly tight.

The barrel of the tower was carried up to a height of 66 feet. A special set of inside forms, about 2 feet high, extending to the springing line of the dome, was then put in, and the dome forms were set up on it. The idea was that this 2-foot form could be knocked out piece by piece and the weight of the dome form taken on wedges to the last 6-foot form, these wedges being gradually slackened down in order to allow the dome form to settle clear of the dome. As a matter of fact, this was done, but the dome forms, being very tight, did not settle, and had to be pried off a section at a time. A similar method was used for slacking down the roof forms, with similar results.

After the dome forms had been put in, the concrete was carried up approximately to the elevation of the bottom of the rings. Small neat cement pads were then put in and accurately levelled, and on these the steel rings were placed, and the steel tank was erected.

In order to ensure a perfectly round tank, each course was erected against wooden templates accurately centered and fastened to the inside scaffold. The tank is the ordinary type of light steel, the lower course being 3/16-inch, the next, No. 8 B.W. gauge, the next, No. 10 B.W. gauge, and the remaining four, No. 12 B.W. gauge.

Work on the foundation was started on August 15, 1908, and the tower was not completed until April 1, 1909. Much time was lost waiting for the delivery of the steel, and also owing to a period of very cold weather which caused entire cessation of work for about one month.

The tower as completed presents a striking appearance. In order to obliterate rings due to the successive application of the forms and to cover the efflorescence so common to concrete structures, the outside was given two coats of neat cement wash applied with ordinary kalsomining brushes, and, up to the present time, this seems to have been very effective in accomplishing the desired result. Irregularities due to forms are unnoticeable at a distance of 200 or 300 feet, and the grouting gave a very uniform color. The application of two coats of cement wash cost, for labor, $97.68, and for material, $15.18, or $1.32 per 100 square feet, labor being at the rate of $2.25 per 8 hours and cement costing $2.53 per barrel delivered on the work.

The tower was designed by Arthur L. Adams, M.Am. Soc.C.E., under whose direction the plans for all the work of remodelling the waterworks system were prepared and executed. The forms, scaffolding, etc., were designed by the writer, who was also in immediate charge of the erection.

Tenders received for the construction of the tower covered an extremely wide range, and indicated at once the utter lack of knowledge on the part of the bidders of the cost of a structure of this kind. Inasmuch as none of them had had previous experience in this class of construction, the engineer deemed it the part of wisdom and economy to retain the construction under his immediate supervision, and, therefore, the work was done by day's labor.

The rates of wages paid, all being on a basis of an 8-hour day, were as follows:

Common labor	$2.25 and $ 2.50
Carpenter	4.00
Carpenter's helper	2.75
Boilermaker	3.50
Holders on	2.50
Boilermaker foreman	5.00
Plasterers	6.00
Plasterers' helpers	3.00

The cost of material was as follows:

Cement, per barrel	$ 2.53
Sand, per yard	1.47
Rock, per yard	0.80
Lumber, per 1,000 feet B.M.	$14.00 and $16.00

All these prices are for material delivered on the work.

An examination of the cost data, as given, will show that for the most part the unit costs are very high. This is due chiefly to the continued interruption of the work, during its later stages, owing to bad weather, particularly in the case of the erection of the steel tank. The material cost in this case was also exceedingly high In the case of the concreting, inability to purchase a hoist and motor and the high cost of renting the same, together with the delays mentioned, added greatly to the unit cost. When it is considered that the cost of plastering covers that of four coats over the entire inside of the tank and three more over about one-third of it, it does not appear so high, especially in view of the high rate of wages paid. The cost per yard for concrete alone was $25,126, and this is probably about 25 per cent. in excess of the cost of the same class of work executed under more favorable conditions as to location, weather conditions, etc.

The following costs have been rearranged from the tables given by the author:

	Total	Per cu. yard.
Preliminary work—		
Labor, carpenter at 50 cents per hour	$ 11.00	
Labor, common, at 34.4 cents per hour.	64.94	
Labor, common, at 28.1 cents per hour.	249.67	
Total labor	$ 325.61	$ 0.790
Materials	133.62	0.324
Total labor and materials	$ 459.23	$ 1.114
Forms: Building, Shifting, Stripping—		
Labor, carpenter, at 50 cents per hour	$1,832.99	
Labor, common, at 34.4 cents per hour.	80.85	
Labor, common, at 28.1 cents per hour.	563.84	
Total labor	$2,477.68	$ 6.014
Materials—		
Lumber	$ 583.49	
Hardware	325.51	
Miscellaneous	13.90	
Total material	$ 922.90	$ 2.240
Grand total	$3,400.58	$ 8.254
Scaffold: Erecting and tearing down—		
Labor, carpenter, at 50 cents per hour.	$ 693.00	
Labor, common, at 34.4 cents per hour.	350,59	
Labor, common, at 28.1 cents per hour.	117.27	
Total labor	$1,160.86	$ 2.818
Materials—		
Lumber	$ 487.77	
Hardware	202.79	
Total materials	$ 690.56	$ 1.676
Grand total	1,851.42	4.494
Concreting—		
Labor at 50 cents per hour	$ 142.00	
Labor at 34.4 cents per hour	11.00	
Labor at 28.1 cents per hour	947.81	
Total labor	$1,100.81	$ 2.672
Materials—		
Rock	$ 317.30	
Sand	335.72	
Cement	1,591.97	
Total material	$2,244.99	$ 5.449
Hoisting—		
Rental motor and hoist	$ 406.56	
Power	83.53	
Total power	$ 490.09	$ 1.189
Grand total	3,737.89	9.316
Grand total concrete	9,449.12	23.178

These figures do not include apparently any charge for superintendence, which, with perhaps some other items, may account for the difference between the final total and the cost of $25,126 for concrete given by the author of the paper.

The cost of plastering 3,000 square feet was as follows:

	Total	Per sq. foot.
Labor—		
Plasterers, at 75 cents per hour	$ 116.50	
Labor at 46⅞ cents per hour	15.00	
Labor at 37½ cents per hour	198.52	
Labor at 28.1 cents per hour	105.66	
Total labor	$ 435.68	$0.1452
Materials—		
Sand	$ 8.64	
Cement	66.10	
Alum and potash	16.00	
Total material	$ 90.74	$0.0302
Grand total	$ 526.42	$0.1754

The cost of washing 8,560 square feet with cement wash was as follows:

	Total	Per sq. foot
Labor—		
Common, at 43¾ cents per hour	$ 50.00	
Common, at 28.1 cents per hour	47.68	
Total labor	$ 97.68	$0.0114
Material—		
Cement	$ 15.18	$0.0018
Grand total	$ 112.86	$0.0132

The itemized cost of the steel tank, 20,000 pounds, was as follows:

	Total	Per lb.
Labor—		
Carpenter at 50 cents per hour	$ 124.24	
Helper at 34.4 cents per hour	2.75	
Boilermakers	382.57	
Holders on	147.33	
Labor	40.61	
Foreman, at 62.5 cvents per hour	186.25	
Total labor	$ 883.75	$0.0441
Materials—		
Tank, rivets, etc.	$1,740.69	$0.0875
Grand total	$2,624.44	$0.1316

The various miscellaneous items of cost were as follows:

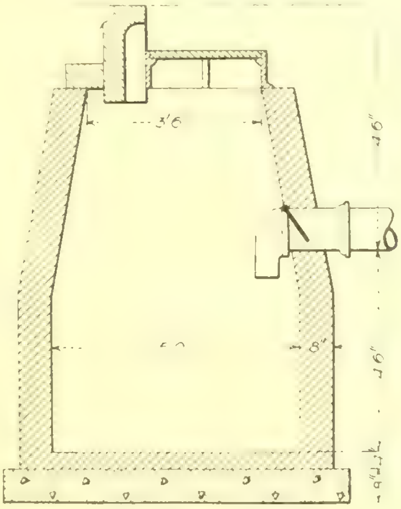
	Total.
Windows, Doors, etc.—	
Labor	$ 49.00
Material	47.26
Total	$ 96.26
Equipment, 40 per cent. of $461.46	184.58
Ironwork (Spiral stairway, inlet and overflow pipes, radiator, reinforcing steel, etc.):	
Labor—	
Machinists, at 50 cents per hour	$ 89.50
Helper, at 34.4 cents per hour	240.16
Labor, at 28.1 cents per hour	100.79
Total labor	$ 430.45
Material	$ 1,814.71
Grand total	$ 2,245.16
Grand total (tower, and tank complete)	$16,578.29

Slow Sand and Mechanical Filters

At a meeting of the Canadian Society of Civil Engineers held at Montreal last week, Mr. R. S. Lee, consulting engineer to the Provincial Board of Health, read an interesting paper, entitled, "Recent Developments in the Purification of Public Water Supplies." Concerning the relative merits of slow sand and mechanical filters, Mr. Lee said: "It is a question that has received considerable unprofitable and not entirely disinterested and fair discussion. The two systems do not admit of a rational comparison in the abstract. Both are wonderfully efficient machines in the accomplishment of the work legitimately required of them, and the varying conditions encountered in the field of water purification present a variety of problems in the solution of which both systems are a necessity."

Cost of Brick Catch Basins

In connection with their investigations into the cost of catch-basins in Boston, Messrs. Metcalf & Eddy, in a report to the Finance Commission of that city, give the accompanying reasonable costs for the type of structure shown herewith:



Brick Catch Basin

2,000 brick at $10.50	$21.00
4 barrels American cement at $1.15	4.60
20 feet 10-inch pipe at $0.22	4.40
One 12 x 10-inch Y at $1	1.00
Guttermouth	9.00
D-frame	10.00
Trap	2.00
Total materials (furnished by the city)	$52.00
Inspection by city	5.00
Teaming by city	3.00
Contract:	
Laying brick	12.00
Excavation	10.00
Backfill	4.00
Sand	3.00
20 per cent. profit on contract	6.00
Making connections	5.00
Laying 20 feet of drain pipe	15.00
Total	$115.00

It is interesting to compare this estimated reasonable cost with the actual costs. In 1906-07 211 basins were built by contract at $177 each, and 46 by day labor at $179 each; in 1907-08, 221 basins were built by contract at $190 each, and 15 by day labor at $228 each

Relative Cost of Sewer Work at Hamilton Ontario

The main sewer on Princess street, Hamilton, Ont., from Sherman avenue to Wentworth street, is 24 inches diameter, and it was proposed to build this with fire clay pipe. All the other main sewers, being of larger diameter, were built of concrete. Before finally deciding on fire clay pipe in that section, 100 feet of 24-inch sewer was laid, composed of concrete, mixed 1 : 2 : 4, four inches thick, two-thirds of the sewer being constructed in the trench, the upper one-third was moulded on the surface and placed in the sewer after being properly set. The cost of this section of sewer was carefully kept in detail, with the result that the concrete sewer was found to be much cheaper than the fire clay pipe. Therefore, it was decided to construct a concrete sewer in this section.

Cost of 24-inch diameter concrete sewer labor and materials—100 lineal feet:

Labor—	
Bottom, 2 : 3, nine men 9 hours at 20c	$16.20
Bottom, 2 : 3, setting moulds, 3 men 9 hours at 20c.	6.21
Top, 1 : 3, moulding, 2 men 18 hours at 20c	7.20
Setting tops	10.00
Material	
70 bags cement	35.00
5 loads gravel (10 cubic yards)	10.80
Coal for mixer	1.00
Total cost for 100 feet	$86.41

Cost per lineal foot of concrete pipe sewer, 24-inch diameter, 86 4/10 cents.

The fire clay pipe cost about $1.22 per foot, laid in the sewer. The cost of the 24-inch fire clay pipe alone was $1.13¾, to which was to be added the cost of yarn, cement and laying.

Influence of Size of Building upon its Cost

In connection with an investigation of the cost of mill buildings, Charles T. Main, mill engineer and architect, of Boston, has established some interesting relations between the size of a building and its cost. He shows that there is an immediate decrease in cost as the width is increased, due to the fact that the cost of the walls and outside foundation, which is an important item of cost, relative to the total cost, is decreased as the width increases.

For example, supposing a three-storey building is desired with 30,000 square feet on each floor.

If the building were 600 x 50 feet, its cost would be about 99 cents a square foot.

If the building were 400 x 75 feet, its cost would be about 87 cents a square foot.

If the building were 300 x 100 feet, its cost would be about 83 cents a square foot.

If the building were 240 x 125 feet, its cost would be about 80 cents a square foot.

Of course, the exact figures as to cost will vary year by year and with the locality, but the relative values will remain practically constant.

The minimum cost per square foot is reached with a four-storey building. A three-storey building costs a trifle more than a four-storey. A one-storey building is the most expensive. This is due to a combination of several features.

(a) The cost of ordinary foundations does not increase in proportion to the number of storeys, and therefore the cost is less per square foot as the number of storeys is increased.

(b) The roof is the same for a one-storey building as for one of any other number of storeys, and therefore its cost relative to the total cost grows less as the number of storeys increases.

(c) The cost of columns, including the supporting piers and castings, does not vary much per storey as the storeys are added.

(d) As the number of storeys increases, the cost of the walls, owing to increased thickness, increases in a greater ratio than the number of storeys, and this item is the one which in the four-storey building offsets the saving in foundations and roof.

The saving by the use of frame construction for walls instead of brick is not as great as many persons think. The only saving is in somewhat lighter foundations and in the outside surfaces of the building. The floor, columns and roof must be the same strength and construction in any case.

Placing Concrete Aqueduct Lining in Freezing Weather

Owing to delays in building the foundations and piers of some of the aqueduct bridges on the Illinois & Mississippi Canal it was necessary to place some of the concrete lining in cold weather. It was important, therefore, that precautions be taken to keep the concrete from freezing. The methods employed were described by Mr. H. E. Reeves, U. S. junior engineer, in a paper before the last convention of the Illinois Society of Engineers and Surveyors.

The last concrete was deposited Dec. 28th and the temperature during the final weeks dropped as low as 12 degrees or 15 degrees above zero, barely rising to the thawing point in the middle of the day. Owing to the thinness of the lining, 6-inch on the bottom of the trough and 9-inch on the sides, and its exposed position, considerable care was necessary. To heat the concrete materials, the exhaust steam from the mixer engine was turned into the drum of the mixer. This was accomplished by conducting the exhaust pipe to a point in front of the discharging opening of the drum, so that the drum when tilted for discharging would just clear the end of the pipe. The force of the exhaust then carried the stem into the revolving drum, where complete mixture with the dropping particles of concrete utilized practically all of the heat remaining in the steam. Though the expense was absolutely nothing, the results were really surprising. The temperature of the deposited concrete averaged probably 70 degrees, while if a batch were left in the mixer 3 minutts or more its temperature would be 90 degrees to 100 degrees.

To protect the deposited concrete, the inside of each 35-foot span at the close of the day's work was roofed over with inch boards laid loosely on horses, the ends being closed with pieces of canvas; and into the room thus formed live steam from the boiler was conducted through a hastily laid pipe line. The night watchman kept up the steam, the amount needed being very small. Steam was kept on the concrete for two nights or for about 40 hours after being laid. It was considered that the outside was sufficiently protected by the 2-inch forming. On the third day the forms, if needed, were removed and the concrete left exposed. The cost of this protection was about 12 to 15 cents per cubic yard of concrete and the results, Mr. Reeves states, were perfect. As an illustration of the need of protection, it may be noted that the feed pipe for the boiler froze one night about midnight and steam was shut off from the concrete for about 7 hours. The concrete froze to some extent, and about ½-inch of the surface afterwards shelled off.

Machinery in the Manufacture of Brick

Criticism of Various Types of Brick Making Machines by an English Authority — Relative Merits of Hand and Machine Made Brick

At a recent meeting of the Royal Society of Arts held in London, Eng., Mr. A. B. Searle dealt with the introduction of machinery in the manufacture of bricks. There are two difficulties in connection with hand manufacture: (1) restricted output on account of the slowness of hand workers; (2) scarcity of skilled workers. The number of really skilled workmen is gradually diminishing, and the impetus to evolve machine methods was given some years ago, when large quantities of bricks were suddenly demanded. There are two main types of brickmaking machines, the so-called soft-mud brick machine, which is very much more used in America than in England, and in which the paste, in a fairly stiff mass, is forced into moulds. The second type of machine, more common here, may be likened to a sausage machine, the paste being forced through dies into moulds capable of making six or more bricks at a time. Another form of this type of machine presses out the paste horizontally in the form of a band, which is afterwards cut by wire or rotary knives, the former being the most common. The origin of this type of machine dates back 40 years, and the modern forms now used here are a development of the original American machines. Several types of machine on this principle were described. A feature of them is the safety doors, which enables the clay to relieve itself when there is excessive pressure in the dies or mouthpieces. Such machines are capable of turning out 6,000 to 8,000 bricks per day without any skilled workmen, and the bricks, if the earth is suitable, are in every way equal to hand-made bricks. Speaking generally, Mr. Searle expressed the opinion that whilst, perhaps, from the artistic point of view, perfectly hand-made bricks are better than machine-made, yet machine-made bricks manufactured under good conditions are superior to bricks made by inferior workmen. The machine most resembling the action of the workman in its operation was the later form of the Henry Clegg machine ,although only three bricks could be made at one time. In this machine the safety doors were rather clumsy, these being operated by heavy weights instead of springs. By means of rams, the pug-mill action was continued in two chambers, and even afterwards, when the paste was being driven down to the dies. The result was a brick of a rather different texture to those made in machines of the plunger type. This particular type of machine is largely used in India.

Where Wire-Cutting is Necessary

Coming to machines in connection with which moulds are discarded in favor of wire-cutting, it was pointed out that this method is the more desirable, and even necessary, where the material contains more pure clay and less silica and sand. Machines of the sausage type, discharging the clay horizontally through an aperture, and thence on to the cutting machine, are always used where a sand faced brick is not required. Views of various types of these machines were shown, ranging from the single rollers, through which the paste is passed after leaving the pug-mill, to machines having several sets of "expression" rollers, these having been proved to turn out a paste less liable to cracking in the subsequent treatment. In connection with auger machines, in which a spiral is used on the end of the shaft to propel the paste through the die, Mr. Searle said that brickmakers in England had yet to appreciate the advantages of these. He advocated having upon the horizontal shaft a sufficient length of spiral, as well as the ordinary mixing blades. The propelling power of the mixing blades was in inverse proportion to their mixing power, hence the desirability, in order to save power, in having the spiral or propeller. This is an important matter, and mistakes of a serious character were made in this connection. The average brickmaker in this country had very confused ideas on this subject. Whilst he had the mixing blades, he did not care about the propeller. He believed brickmakers were sometimes foolish enough to take out the propeller and put in additional mixing blades, with the result that there was loss of power.

Brickmakers, too, would do well to pay more attention to the design of mouthpieces. German manufacturers of brickmaking machinery were a long way ahead of us in this country. We certainly made better bricks than the Germans, but the Germans used their power to better advantage. Ordinary straight push mouthpieces were not satisfactory owing to loss of power due to friction, and a number of systems of lubrication by water, water and oil, and by steam, were illustrated.

Another detail of importance was the use of a collar between the pug-mill and the die. This tended to prevent cracking of the brick in the after treatment. He had given much attention to this subject, and his experience was that unless the collar was carefully constructed a large loss of power resulted.

The lecturer then described the actual cutting of the clay into bricks by the wire process. Automatic cutting of the strip before being driven on to the wires had not been altogether satisfactory, owing to the pressure necessary to operate a mechanical automatic apparatus tending to raise the centre of the strip, and so spoil one or two bricks. An improvement had been effected in this direction, however, by an electrical attachment. As a contact only had to be made to set the cutting machine in motion, the difficulty referred to above had almost, if not entirely, disappeared. All cutting machines in England work on the sideways principle, but the Americans perfer not to cut their bricks sideways, the system commonly in use there being rotating cutters, which cut the paste from the top downwards. A number of machines were described for separating stone and the larger particles from the paste where the nature of the earth used renders the presence of these inevitable.

The lecturer expressed a preference for the tunnel method of drying bricks artificially, for the reason that the bricks can be placed on a car and wheeled through the tunnel, thus reducing the handling to a minimum.

That the smaller cities and towns of the Dominion are also in the march of progress is exemplified to some extent by Sydney, N.S., which boasts of permits to the value of $108,935 for the first four months of 1910, against $21,000 for the corresponding period of 1909.

Vancouver still hits the high water mark for building in Canada. The increase for the first four months of 1910 over the same period of 1909 was nearly [illegible] millions. Bank clearings were a clear million better than the best previously, and the Customs receipts jumped over 50 per cent.

There is a scarcity of labor in the West and consequently workmen are showing a disposition to get all they can. At Saskatoon, Sask., last week, 50 corporation employees working on sewer construction at [illegible] cents an hour struck for 25 cents. They are stated to have 30 cents an hour in view.

Original and Artistic Design in Concrete

Thus far in the career of concrete as a building material attention has chiefly been directed to its structural and practical significance, while the possibilities of the pure design side of the question seems to have been very much neglected. It seems unusual that a material offering so many original opportunities to branch away from the trodden path is not studied with more enthusiasm by the architectural profession in general, says Ray Moulthrop in the "Cement Age." The architectural schools and ateliers that are suposed to deal more with theory and possibilities, have ignored it. If a student in one of these schools tries to see what he can do, he would receive no credit in design, for the instructors, who have probably been trained in the Beaux Art school, can only interpret it in the language of the materials they already know.

The most perfect reflection of any period is its architecture, and to-day is no exception to the rule, for the orthodox antagonism to concrete does almost rival the creeds of some of our religious denominations.

The peculiar possibilities of concrete gives it many features that distinguish it from other materials, and those features are enough to bring about for itself a distinct and original style of architecture. It is a situation that demands an original style, and, when this fact is recognized, it may prove to be the solution to the problem of the fugitive "20th century style."

It was the arch that most of all differentiated the architecture of Rome from the styles that preceded it. With concrete, this corresponding feature is the long span that is possible over openings. The windows are not regulated to customary widths, because of the practical limits of the stone lintel. Thus the success of the design will be aided, not by imitating masonry conventions, but by exaggerating the use of a practical divergence. This shows that it frankly intends to represent the material that it is, and not an imitation that has gone before. Also balcony brackets and short cantilevers, and the like, appear more satisfying and stable than in stone.

Balance Before Symmetry

Balance in concrete design is a greater law than symmetry. Symmetry is weak. It is the first thing a child would contrive, to make one side exactly match the other. A little irregularity gives character to a design, just as it gives more strength to a man's countenance to part the hair on one side. Concrete is a heavy appearing, robust material and would be compared to the male form. In the beginning of every great period of architecture this comparison was the rule, but in the Rococco or the decline of the period, the architecture is more likened to the easy curves of the female figure, and all through the sculpture and decoration of this decline, the female form predominated. There are many of these general signs that foretells concrete to be a major factor in the development of the architecture of the future.

Classic details, slender pilasters, coins and similar embellishments are foreign and unnatural to concrete, but to make up for this loss, it admits of many original features in decoration, not possible in stone. No material is so well suited to combine with brick or ornamental tiles. Some of the lessons learned from the artificial style of Art Noveau are as timely as if directed by providence.

Ornament, no matter how intricate, when applied to concrete, should have a large unbroken surface to set it off. If the background is laced with mouldings and shadows, half the value of the ornament is lost. It is by the same principle that a diamond is exhibited on an expansive field of velvet, and not surrounded by a collection of jewelry. What is true of ornament, is also true of window decoration. There are few things prettier than good stained and leaded glass windows and there is no material that furnishes such a harmonious setting for these as concrete. The opening is even better without the suggestion of an architrave or frame around it. We have a very orthodox view of thinking that stained glass belongs only to a house of worship. Much of the value of the best use of glass in churches is lost, because it is continually striving with the buttresses and details around it to decide which was intended as the feature. In concrete, this should be avoided, and the glass be made the jewel. It is these features that give life, and a little color gives the necessary snap, without endangering the refinement and good taste of a finished design.

As the material is plastic, and can be moulded at will, let the window boxes, concrete pottery and foliage pedestals be an integral part of the design. These features have been much disregarded in the past, but are being more and more recognized as important factors in the architectural treatment; and what material so lends itself in this direction as concrete? The fact that it gives a setting to statuary more harmonious than a cold background of granite or of brick, shows that it will be a stimulus to the cause of the sister arts and many other signs equally apparent, proves that its destiny must be in the foremost building material of the future.

A House with Plate-glass Cornice or Eaves

A pretentious residence recently erected at Waterbury, Conn., has a considerable overhang of cornice or eaves, which, if constructed in the usual materials, would have tended to darken the bedrooms on the first floor. In considering the original plans, the client objected to the cornice for the reason stated, but in order to overcome the difficulty by ordinary methods of design, it would have been necessary to raise the roof or to narrow the cornice, either scheme having the effect of destroying the lines of the house. It was finally decided to use plate glass for the overhang, this material affording all the light that could be desired, and at the same time, owing to the quality and thickness of the glass used, giving the requisite strength. The high polish of the surface keeps this free from dirt. The additional cost is "a few hundred dollars."

R. A. I. C. Convention

Preparations are being made at Winnipeg for the entertainment of the Royal Architectural Institute of Canada, which will hold its third annual meeting in that city this fall. This is the first time that the annual meeting has been held in the west, and there is a marked degree of enthusiasm being shown by the local men in their arrangements for the convention. It is expected that about 150 of the leading architects of the Dominion will attend the convention. Mr. Samuel Hooper has been elected chairman of the arrangement committee.

Mr. A. S. Blizzard, managing director, G. Woolliscroft & Son, Limited, Hanley, Staffs., Eng., manufacturers of all kinds of tiles, terra cotta, faience, mosaic, etc., is now on his way to Montreal with a view to investigating carefully the Canadian field. It is interesting to note that Mr. Blizzard is president of the Northern Staffordshire Chamber of Commerce. "Woolliscroft" products have already been favorably received in the Dominion. A much wider market for them can safely be predicted.

The city engineer of Seattle, Wash., Mr. R. H. Thomas, who, it is interesting to note, has held the position for the last 14 years, is anxious to attend the International Good Roads Convention to be held in Brussels this summer, but in view of the fact that improvements involving the expenditure of $11,000,000 are under consideration, the authorities have notified him that he must either abandon the idea or hand in his resignation.

The Schedule of Output for Checking Cost

Arrangement and Methods of Keeping Same—Importance of Proper Organization—How to Secure Co-Operation of Employees

By A. O. Davidson

One of the difficult problems confronting the contractor in the prosecution of a piece of work is the continuous daily average production of the required amounts in order to complete his contract within the specified time.

The principal object in a regular scheduled daily production is the advantage gained by the contractor in having his work so scheduled that he knows each day what is required in quantities of output in order to complete the work on time. It also gives him the advantage to be gained by such an arrangement in keeping the labor costs of his work within the estimate.

The specifications covering a piece of work give the approximate quantities as well as the limit of time in which the job is to be completed. With this information it is a simple matter for a contractor to arrange a schedule at the time he makes up his bid from which he can determine the quantities of each classification of work which it is necessary to accomplish daily. If the conditions are such, and the organization is sufficiently strong and well balanced, to accomplish more than the schedule calls for, the contractor is that much "to the good," which gain may, in some cases, be required to offset some extreme conditions which may arise, and for which he has not been able to make any allowance in estimating the actual number of working days he will have.

Best Method of Arrangement

The best method for arranging a schedule is to first determine as nearly as possible from the records of weather during several preceding years the amount of time which it would be safe to figure as working time out of the entire contract period. After this allowance has been made a further deduction should be made for all Sundays, holidays, etc., which will leave a specified number of working days in which it will be necessary to accomplish the work under the contract. After the number of days has thus been determined, it is a very easy matter to figure the quantities which it will be necessary to accomplish daily in order to complete the work within contract time. This is arrived at by dividing the total units of any one classification of work contained in the contract by the number of working days in which it is to be accomplished. It is thus necessary to subdivide the total number of working days into the proper proportion to the various unit classifications in the order in which they are to be taken up to be accomplished. The first thing, however, is the proper allowance of time required for the installation of plant and machinery for the handling of the work. As an example of the sub-division of time for the accomplishment of the work it is, as a rule, first necessary to take up the earth excavations, which are required to be totally or at least partially completed before any of the other classifications can be commenced. As an illustration in this instance, we will assume that the contract calls for the excavation of 10,000 yards of dry earth, all of which it is necessary to handle before any other portion of the work can be taken up. We will further assume that the contract time limit is such that 100 working days can be allowed as a scheduled time in which this excavation must be handled. It will, therefore, be seen that in order to do this it will be necessary to handle 100 yards of excavation every working day as provided for in the schedule.

We will also assume that the contractor, in figuring this particular piece of work, has based his price on the handling of this excavation by hand, from which it will be seen that practically the only expense in connection with the handling of excavation, assuming that the dirt does not have to be hauled and distributed, will be the labor expense and an allowance covering the small tools required for such work.

We will assume that the contractor has bid 50 cents per yard for this excavation, has made an allowance of 2 cents per yard for shovels, etc., and has figured that this price of 50 cents will allow him a profit of 15 cents per yard over and above his labor cost, allowance for tools and overhead expense. As shown above, he has made an allowance of 2 cents per yard for the cost of tools, and we will assume that he has figured his overhead expense to be 5 cents per yard. Therefore, after figuring his profit of 15 cents, allowance for tools of 2 cents and overhead expense of 5 cents, in order that he may complete this part of the work and earn the profit which he has figured, it will be necessary for him to get the excavation done for 28 cents per yard, which amount must cover the cost of his laborers and foreman for doing the work.

We will further assume that the excavation is of such a character that the output of the average man will be 5 yards per day of 10 hours, and as the schedule requires that 100 yards shall be excavated each day in order to complete this part of the work on scheduled time, it will be seen that it will require a gang of 20 laborers, each of which will be required to produce 5 yards per day in order to accomplish the scheduled amount.

Assuming that the scale of wages for laborers is $1.25 per day, it will be seen that if each man accomplishes his required 5 yards per day, figuring at the rate of 28 cents per yard which the contractor has left to cover this labor expense, each laborer will have earned $1.40 per day, which is 15 cents in excess of the rate of wages paid him—i.e., $1.25. This 15 cents earned by each laborer would amount to $3 per day on the entire gang of 20 men, which amount we will assume is the wages paid the foreman of the gang. Therefore, the foreman of this gang should be furnished with a schedule in the shape of information that he has 10,000 yards of excavation to complete within 100 working days, which will necessitate the removal of 100 yards per day, in order to complete his work within the given time. He should further be informed that his gang shall consist of 20 men and that it is estimated that each man can handle 5 yards per day, which it will be necessary for each of them to do in order that his work may be kept up to scheduled time.

Foremen Should Make Daily Reports

So far as an individual record is concerned, after the foreman has been instructed and given to understand that this amount of work must be accomplished by his gang, it will not be necessary for the office or the contractor to bother further than to keep a check on the output of the gang. The foreman, if he is discharging his obligations to the contractor as he should, will look after the individual output of this gang, and if he finds he has a man employed who does not accomplish sufficient work to enable him to keep up to the requirements, he will replace him. In order to allow the office to keep the proper record of this operation, the foreman should be required to turn in a daily report of the time of these men, in connection with which he is to report each day the quantity of excavation handled. When the time sheet has been figured up in the office it will show the total labor expenditure for this foreman and his gang, which expense, divided by the number of yards excavated, will show the cost per yard, and, as stated above, there is 28 cents per yard figured in the estimate for this purpose; and unless the daily output is 100 yards, the costs are in excess of the estimate and more work will have to be accomplished during the succeeding days in order to keep the cost down to or below the 28 cents per yard.

In this connection it is also a good plan to adopt a bonus scheme and instruct the foreman that he and his men will participate proportionately with the contractor in any saving that they may effect in the reduction of cost in this particular operation. An arrangement of this kind is an incentive to both the foremen and the men to exert their best efforts in behalf of the contractor.

Where an operation of this kind is worked with a double crew and a bonus offered for an increased output, there is not only the incentive of the extra remuneration, but there is also a rivalry created between the foremen and their men, which not only operates for the benefit of the men individually, but for the contractor as well.

In explanation of the bonus system in connection with the excavation work as explained above, we will assume that the efficiency of the gangs engaged in this work was such that the entire quantities were accomplished in 90 days, instead of 100 days, the limit of time set in which this work was to be done in order to finish on scheduled time. This, then, is a saving of ten days of 100 yards per day, and figured at the estimated cost of doing the work (28 cents per yard) would mean a saving over the estimated figures for labor of $28 per day, which, for 10 days, would mean an additional earning for the contractor of $280.

As the contractor has already realized his estimated profit of 15 cents per yard on this work it is but reasonable to suppose that he will be satisfied with the same additional amount of profit per yard on the additional earnings resulting from the extra efforts of this gang. This would, therefore, leave a margin of 13 cents per yard on 100 yards per day for 10 days, amounting to 1,000 yards, which, figured in dollars and cents, would be $130, the percentage of this additional profit to be divided between the foreman of the excavation gang and his men on the bonus plan.

As the principal factor which results in an increased efficiency of this kind is the ability of the foreman to handle his men in such a manner as to produce this result, he is entitled to the larger amount of this extra part of the saving resulting from his energy. In this case we would suggest that the foreman's share of the amount should be $30, which, when distributed over the period of time in which he has been engaged on this part of the work (90 days), would mean an increase in his regular monthly salary of $10 per month.

The contractor has, therefore, benefited in extra profit to the extent of $150 on the operation and the foreman has earned an extra $10 per month, an amount sufficient to encourage him to redouble his efforts on future work. This then leaves $100 of the extra earnings to be divided equally between the 20 men of his gang, which will allow each individual $5, which, when reduced to the basis of the hourly rate paid them (12½ cents per hour), would mean that each man has received pay for 40 hours extra time, or four days, which he has not been required to work. It is well, in the case of the men, when making an allowance of this kind for increased efficiency, to explain it to them on the basis of extra time allowed for good service, at the same time giving them to understand that any additional increase in efficiency on their part will be proportionately rewarded by additional allowance of time which they do not actually put in.

Importance of Systematic Planning

After one classification of the various operations has been reduced to a daily quantity output, as explained above, each of the other classifications should be taken individually or collectively as they may work in together in the progress of the work, and their individual allowance of working days for their performance should be figured as in the case of the excavation, and this reduced to a gang output, and the foremen furnished with a schedule advising them of the quantities they are required to accomplish, the allowance in dollars and cents that has been made for the payment of their output, and they should be required to report daily their labor expense, together with the amount of their production, the same as in the case of the excavation. The contractor should make up his schedules at the time he makes his estimate in bidding on the work, and, in supplying the required number of men in a gang for the performance of the specified amount of work to be done in a day, should base his calculations on the individual output of the average man in such classification of work in which he intends to make use of his services. A foreman when he is instructed that his gang is required to accomplish a certain amount of work during the day can readily understand that it is necessary for each man in his gang to perform a certain amount, in order that the output of his gang collectively will equal that required by the schedule. He will, therefore, quite naturally watch the individual outputs and dispense with the services of any man who does not perform his portion of the work required.

The contractor should arrange, at the time actual operations on the job are commenced, for a meeting of all his foremen and fully explain to them that in order to complete the work within a given time it will be necessary for them to accomplish a certain amount of work each day, and each one of the foremen should be individually advised as to just what this requirement is, and he should also be required to report at the end of each day on a report blank furnished for this purpose, the actual quantities accomplished that day. If the report is not up to the requirement the foreman should give his reasons for any shortage that has occurred, and if the reason is one over which he and his gang have no control, he should be instructed that such shortage must be made up on succeeding days, and he should be kept advised as to when they have again gained the required amount to have their schedule up to date.

How to Secure Co-operation

These meetings of the foremen should be held at least once a week, and, where possible, twice a week, at which meetings all past performances should be gone into, proper comment made and credit given to the foremen who have accomplished quantities in excess of their schedule, and explanations asked for of those who are not up to the schedule time in their output. In cases where the gangs are behind, suggestions should be asked for of the foremen to remedy the trouble, and such suggestions which seem applicable to the case should be put into use. Where such a course is pursued the foremen soon learn to feel that their suggestions are of benefit, and it creates a desire among them to become proficient in their part of the work; and not only that, but stimulates a desire to gain a better knowledge of the other departments of the work and the best methods of accomplishing the most desirable results, all of which results in great benefit to the work.

It will be noted that the arrangement of schedule as explained in detail in the case of the excavation contemplates the performance of this part of the work by hand, no amount being figured in the estimate for a plant allowance. Where it is necessary to perform the work with machinery a proper allowance should be figured in the estimate for the cost of the necessary machinery which it is intended to use and which is chargeable direct to that part of the work on which such machinery is to be used. This means the charging of a fixed amount per unit of classification, which amount should be sufficient to cover the total cost of such machinery completely installed for the performance of that part of the work on which it is to be used. As this is in reality a fixed charge, there is no means of effecting a saving on this item, with the possible exception of an increased daily machine production in excess of the capacity of such machinery as figured in the estimate.

In the case of production in which material enters, the contractor has an opportunity to effect a saving by reason of any changes in market prices which may occur between the time at which his estimate was made and the time at which he actually places his order for such material. This, however, does not always work to the benefit of the contractor, as the prices of materials may advance instead of decline, and it may be necessary for him to pay more for such materials than he figured in his estimate, unless he enters into contract for such materials at the prices he used in making up his estimate.

It will, therefore, be seen that the principal avenue open to the contractor whereby he can keep his costs down to the minimum is through his payrolls. Therefore, too much attention cannot be given by the management to the systematic arrangement of a daily schedule of output and the proper organization of his men to accomplish the necessary results, as it is the expenditure of money in pay-rolls without the proper returns for such expenditures that results too frequently in the diminishing of profits, and in many cases absolute loss, not only of money to the contractor, but valuable time as well

Construction Data on Street Railway Track

Method and Cost of Work with Grouted Crushed Stone Foundation—Economy of System as Shown by Itemized Table

The following data are given by Mr. H. L. Weber, chief engineer, Columbus, Marion & Bucyrus Railway, Marion, O., in a paper presented to the Central Electric Railway Association, March 24, 1910:

A section of reconstructed track with a grouted, crushed stone foundation was laid on Taylor street, Fort Wayne, Ind., in 1908, and I am informed by Frank M. Randall, city civil engineer, that the work is holding up well. The track was a single line, laid with 73-pound, 6-inch rail. During reconstruction it was necessary to excavate the street from 1-foot to 3-foot, remove the old ties and rails and install the new material. During this work 50-ton interurban cars used the track under a 1½-hour schedule. There were also extra limited and express cars and a small city car service under a 15-minute headway. The city car service was at times delayed a few minutes, but the interurban cars had simply to operate under a slow order. A sufficient number of the old ties were removed so the excavation could be expeditiously done, and enough new ties were added to hold the rails to gauge and make it safe under slow running. The tracks were then let down to the sub-grade.

A trunk sewer had previously been constructed through a portion of the street. This portion was sub-drained with a 3-inch tile. All trenches were examined and if soft places were found or developed after a rain, they were filled with suitable material and rammed with the ordinary 45-pound paver's rammer, manipulated by two laborers.

The outside of the rail, against the web, was filled in advance of the paving with a stiff concrete in the proportions of 1 part cement and 4 of sand. The 8 inches of stone were put under the track in two 4-inch lifts. When the stone was in place, all the old ties were removed and the new ones were put in position. New rails were then laid. The track was then thoroughly tamped to grade four times. The men commenced at one end and continued through the entire length of the line, and a close watch was kept on all portions for apparently soft places. When the tamping was completed the crushed stone foundation was thoroughly grouted for a distance of 15 inches on each side of each rail with a Portland cement grout of 1 part cement and 4 parts good sharp sand.

Over the sewer trench 6 x 8-inch x 8-foot ties were used for the rest of the track 6 x 8-inch x 7-foot ties. At the suspended joints the ties were placed 20-inch centres. There were 30 ties to each 60-foot rail, making the spacing practically 24 inches. It will be noticed that one-third more ties but less concrete, are required by this method of construction. The space between the ties from the base of the rail to the bottom of the ties was filled with a very soft concrete, consisting of 1 part Portland cement, 2½ parts sand, 2½ parts gravel, the gravel containing the sand, and 5 parts crushed stone. The concrete was thoroughly puddled so as to fill under the base of the rails and around the ties, thus giving a bearing surface equal to twice that of the ties. The space between the rails and for a distance of 1 foot outside the rails was paved with brick, with a special block on the inside of the rail to form the flangeway. The itemized cost of the work is given in Table 1.

TABLE 1. COST OF STREET RAILWAY TRACK

Track work and material	Per lin. ft. of track
Labor laying track and one-half excavation	$0.413
Ties	0.274
6-inch, 73-pound steel rails	0.700
Rail and cross bonds (compressed)	0.012
Bolts	0.004
Spikes	0.004
Splice bars	0.055
Total cost of track work per linear foot	$1.462
Track foundation, 8-inch crushed stone, grouted	
Labor	$0.129
Stone delivered	0.231
Drain tile	0.011
Cement and sand for grouting	0.035
Total cost of foundation per linear foot	$0.406
Concrete foundation for paving—	
Labor, including one-half of the excavation	$0.336
Stone delivered	0.114
Cement	0.114
Sand	0.028
For use of tools	0.013
Total cost of paving foundation, per linear foot	$0.605
Brick pavement	
Labor	$0.114
Metropolitan paving block	0.505
Metropolitan special shapes	0.180
Cement	0.028
Sand	0.021
Track drains	0.005
Mixing boxes, etc.	0.004
Total cost of pavement per linear foot	$0.857
Grand total cost per linear foot	$3.328

Cost per square yard of brick pavement, including foundation complete, $1.946.

Length of track constructed, 2,332 linear feet

Brick pavement, 1,794 square yards

Trade News from Montreal

Labor Troubles fading away in this Section—Supply Market in Healthy Condition—General News

Montreal Office of the "Contract Record."
May 14th, 1910.

No further evidence of labor troubles has been manifested during the past week and building operations are consequently progressing undisturbed, favored with excellent weather conditions.

Conditions of Supply Market

Shipments of Scotch water pipe are commencing to arrive by the water routes and the spring demand for this material is said to be quite brisk.

Along the harbor front there are evidences that brick will not be scarce this year. Every barge continues to dump its quota on the docks.

Cement, according to the different dealers, is in active demand at present, with prices unchanged from former quotations. With the letting of the extensive paving contracts as planned by the City Surveyor's Department, a still larger demand of this product is expected.

New William Dawson School

The progress of construction on the new William Dawson School, Christopher Columbia avenue, for the Board of Protestant School Commissioners, is being somewhat retarded owing to the poor foundation conditions which the contractors, Messrs. Gray & Wighton, are experiencing, and the building will not be partly completed by September, as was anticipated. It has been decided advisable to place the foundations on bed rock, a distance of 24 feet, and, accordingly, piles are being driven to receive the concrete footings.

This building, which was designed by Mr. A. F. Dunlop, is to bé four storeys in height and fireproofed throughout. It will contain 31 classrooms, and accommodate 1,500 pupils.

The exterior facades will be in Jacobean style, treated in a simple but dignified manner. The base will be built of dressed limestone and the superstructure will be finished with pressed brick and Roman stone trimmings. The latter are being supplied by Messrs. T. A. Morrison & Company.

Blaugas Company in Operation

The factory and plant of the Blaugas Company of Canada, at Cote St. Paul, has been placed in operation. This company was recently organized with a capital of $3,500,000 to manufacture a petroleum gas invented by Prof. Blau, of Augusburg, Germany, and is made from the refuse of crude petroleum, heated and compressed until liquified. It is supplied in steel cylinders under pressure and vaporizes on release to a dry gas.

There is no carbon dioxide present in the composition of the gas and therefore danger of asphyxiation in case of leaks is minimized. It is claimed for this gas that it is non-freezable, no matter how severe the weather, and also that it is three times less explosive than ordinary city gas and that it is therefore practically a non-explosive.

Its adaptability to the needs of contractors was demonstrated at the Jacobs Building, where it was successfully used. The directors of the Canadian company are Messrs. M. B. Davis, J. A. Jacobs, H. Markland Molson, Andrew A. Allan, R. C. Smith, F. C. Fairbanks and C. H. Balfour, of Montreal, and their office is located in the Jacobs Building.

Labelle Company's Building

Mr. Joseph Bourque has been awarded the general contract for the erection of the new building for the H. P. Labelle & Company, Limited, St. Catherine street and City Hall avenue, designed by architect Mr. G. A. Monette.

The new structure will front on City Hall avenue, will be 42 feet wide by 85 feet deep, eight storeys in height. The total floor area will be approximately 52,160 feet. The building will be of skeleton steel construction, fireproofed throughout, and the facade on St. Catherine street will be finished with glazed terra cotta. Automatic sprinklers are also to be installed and also modern elevator systems.

The Phoenix Bridge Company have the contract for the steel fabrication and erection, and Dolton & Company's "Carrara" terra cotta is specified.

A Novel Apartment House

Plans have been drawn by Mr. Wm. E. Doran, architect, for an annex to the Prince Apartments on Guy street, and also for a new apartment house to be erected at the corner of Guy and Luke streets. This latter building is to be known as the "Magic" and will embody several new constructional features. Instead of being subdivided into suites containing several rooms, an appartment will consist of one large room with kitchenette and toilet room attached. This room will be fitted with transposable furniture, which will make it serve as bedroom, living room, dining room, etc., as the occupant desires.

The furniture, when not in use, will be turned into thoroughly ventilated closets and is to be built after the Merrill patents. The structure will be thoroughly fireproofed and will be equipped with every modern improvement. A novel arrangement is that the janitor service will include the washing of dishes, a feature not usually supplied. The building is for Mr. J. A. Prince, who is superintending the construction work, but it is expected that tenders for several trades will be asked later.

Canadian Railway Club Election

Mr. A. A. Maver, master mechanic, Grand Trunk Railway Company, was elected president of the Canadian Railway Club in succession to Mr. H. H. Vaughan at the recent annual meeting held at the Windsor Hotel, Montreal. The other officers elected were: Vice-president, A. A. Goodchild, auditor of stores accounts, C.P.R.; 2nd Vice-president, James Coleman, superintendent of the car department, Grand Trunk; Secretary, James Powell; Treasurer, S. S. Underwood, chief draftsman of the Grand Trunk; Executive Committee, Messrs. A. L. Grayburn, R. W. Burnett, H. C. Butler, C. Kyle, William McNab and F. Ditchfield; Auditors, Messrs. H. A. White, J. S. Johnstone and G. I. Evans. Mr. J. Powell, the secretary, reported that the club was in a flourishing condition and papers were read showing the progressive value and improvement of the association. The members in good standing number 650, although 154 have been struck off during the year for non-payment of dues. The balance in hand is $2,905, as compared with $2,287 last year. A committee was appointed to report on the advisability of utilizing the money in hand for the purpose of establishing a reference railway library in connection with the club.

Place Viger Station Extensions

Messrs. John Stewart & Company, who have the contract for the foundation work in connection with the extensions to the Place Viger station for the C.P.R., commenced operations last week.

The new superstructure which the railway company will erect at this point will be quite extensive and a large appropriation has been made for this purpose. The present station and hotel building will also be considerably remodelled and improved.

Canada Cement Company

During the past week the Canada Cement Company have settled in their new office quarters in the National Bank Building, corner St. James street and Place d'Armes Hill. The company are completely occupying the two top floors of this recently remodelled building and are quite comfortably situated.

It is interesting to note that, according to Mr. W. H. Ford, general sales manager, the different cement factories operating under this company's direction, are in receipt of much larger orders than was the case at this time last season. The average prices obtaining for cement now are also well below last year's figures.

The Canada Cement Company are now organizing an extensive advertising compaign for the purpose of booming the use of cement among Canadian farmers, and with this in view they are preparing a special catalogue.

The company also intend to issue a series of bulletins outlining the different uses of cement. One of these will be published in the interests of the different municipalities and will deal with methods in the construction of concrete roadways and bridges. Another one will be published for the benefit of architects and engineers, and the whole series will doubtless contain some very interesting material.

West Crescent Heights

West Crescent Heights is to be the new name of the Holt & Gordon property, situated in the western section of the Westmount upper level. It is stated that plans have been prepared by Messrs. Brett & Hart, landscape architects, Boston, Mass., and that this extensive property will be improved. The streets are to be laid out in broad curving boulevards, lined with trees, running at a slight gradient over the Westmount mountain. Builders will be allowed to erect only the finest type of residences

Notes

An investigation of Mr. Thos. Wand's affairs show liabilities of approximately $85,000 and nominal assets of $54,000. The following committee has been appointed by the creditors to look after their interests: Messrs. K. Stinson, N. Sarrison and J. K. McNutt.

Mr. G. Kahn, general sales manager of the Trussed Concrete Steel Company of Canada, Limited, was in Montreal this week.

Mr. W. E. Ramsay, manager of the Montreal office of the Pedlar people, has just received an extensive order from the city of Montreal Waterworks Department for Pedlar culverts to be installed during the present season.

The Sellers Anchor Bottom Tie Plate Company, of Canada, Limited, has been organized and are applying for a Dominion charter. The company intend to manufacture tie plates, railway supplies and iron and steel specialties. The concern is to be capitalized at $100,000, and Montreal men are said to be interested.

The first of the three big steel dredging barges which the Structural Steel Company are building at Longue Point for the Canadian General Development Company, was successfully launched last week.

Mr. N. C. Nichols, of the New York Dual Continental Filtration Company, which has filtration systems installed in Ste. Hyacinthe, Buckingham, Longueuil and Verdun, is in Montreal investigating local water conditions.

The Latest in Sterilizing Apparatus

After a series of experiments, a French scientist has succeeded in constructing a simple apparatus for the industrial sterilization of water. It consists of a three-jointed metal ditch or channel, through which runs the water to be sterilized. At each joint is a mercury lamp suspended just above the surface of the water. The channel allows of the passage of a volume of water sufficient to supply a town of 20,000 inhabitants. The experiments were made on Seine water, and as it did not contain enough microbes, the scientist and his collaborators emptied cultures of several kinds of microbes into the water.

Four lamps were placed at equal distances. The effective zone of each being 32 inches. The flow of the water was regulated in such a manner that it was exposed to the action of each lamp during eight seconds. Consequently the total action lasted 32 seconds. This is, according to the experiments, double the time required to destroy the baccilli of typhoid, dysentery and cholera. Industrial experiments amply confirmed those of the laboratory. Water which contained per cubic centimetre 5,250 microbes, before reaching the first lamp contained only 3,650 between the first and second. After passing the second lamp the microbes had totally disappeared.

Royalties on Septic Tanks

According to the advice City Engineer Ker, of Ottawa, has received from Mr. W. J. Lynch, chief clerk of the patent office, and Dr. Charles Hodgetts, provincial health officer, the patent of the Cameron Septic Tank Company for sewage purification plans has expired in Canada, and consequently any municipality in the Dominion is now free to install septic tanks without paying royalties to the company. The Cameron Company, which is a United States concern, recently wrote to the authorities at Ottawa warning them not to install septic tanks, as it would be an infringement of its patent rights. In consequence, the work of installing a plant for the purification of the sewage from the western drainage system was delayed until advice was secured.

Concerning Extras

As regards extras, it is usual for the contractor to require an order in writing from the architect, or even from the owner, as a condition to the latter being chargeable with them. When this is required the thing that is obtained must be an order, and not merely a plan or a drawing signed by the architect and not described as an extra. But, if at the end of the contract—or, I presume, earlier—the architect gives a certificate allowing the work as an extra, it is, in the absence of fraud, conclusive, and the owner cannot resist payment on the ground that there was no order. The usual clause of the contract does not contract the parties out of this state of the law, for it provides that the builders are not to execute any work "unless on the authority of the architect shown by order in writing, or by plan or drawing expressly given or signed, or initialled by him as an extra or variation, or by any subsequent written approval so signed and initialled by him?" So that there is either to be a certificate, or a written order, or the drawing or plan, etc., has to appear on its face to be an extra, and to be "expressly given" as such. Indeed, if the builder were to execute extra work without such an order, or its equivalent, from the architect, the owner might not only refuse to pay, but might take the benefit of the work and bring his action against the builder for putting it there!

Most of the disputes between builder and owner, and between builder and architect, arise upon the final certificate, and sometimes the quarrel is between the owner and the architect. It is the business of the architect in making his final certificate, not only to see that the work is completed to his satisfaction, but to calculate the extras, omissions and defects by debit and credit, and to certify in accordance with the balance shown. He is not bound to communicate to the builder the precise mode of reckoning; but, if the calculation is fairly made, he has little to fear from doing so. To do so is a mark of good faith and tends to simplify any questions which the builder may wish to refer under the arbitration clause, even if the exhibition of the reckoning does not stop a reference altogether.

A careless haphazard way of treating a contract is bound to end in trouble and perhaps litigation.—H. Goddard.

The carpenters at Kingston do not look like getting their $3 a day. Last week 23 contracting concerns came to the conclusion that the present wage of $2.50 a day of eight hours is a liberal one.

Canadian City Engineers

Mr. J. T. Child, Calgary, Alta.

The optimistic man is a boon to any community. Particularly is this true if he happens to be a city engineer, for in that case he can do a great deal of good among people interested in the upbuilding and development of the country. We may be thankful that Canada is full of optimists. The city engineer of Calgary, Alta., Mr. J. T. Child, is an example. Here is an extract from a letter to the "Contract Record" which he penned a month or so ago: "We have now at least 35,000 people here and they are all wearing a pleasant smile, knowing full well that their city is designed to become great. When it does, I hope to be on the band wagon, for I have always had implicit faith in Calgary and have seen it develop from an ordinary cow town to quite a metropolis."

Mr. J. T. Child, City Engineer of Calgary

Mr. Child hails from England. He served articles with Messrs. Hopkins, Gilkes & Company, general iron manufacturers and constructional engineers, of Middlesborough, and, afterwards, was for two years with the Ordinance Survey ascertaining parish boundaries in the south of England and Wales. The irresistible call of the West came to Mr. Child in 1883, when he went to Winnipeg and became engaged on draining and reclamation work for the Government. Two years later there was inaugurated the firm of Child & Timewell, which started in an unostentatious manner by opening a small machine shop in Brandon. The rebellion of 1885, however, had an adverse influence upon trade and Mr. Child severed his connection with Brandon and went to Calgary. There, in 1887, he established the firm of Child & Wilson, architects and engineers, with which he remained for ten years. In 1893 Mr. Child designed and laid the first sewers in Calgary. Later, he superintended the construction of some 50 irrigation ditches throughout Alberta. In 1897 he was appointed Assistant Chief Engineer for the Northwest Government, and was stationed at Regina. A change of government in 1902 made a change of scene desirable for Mr. Child, and he made connection with the Northwest Irrigation project which had just started at Lethbridge. A year later he received the appointment of Divisional Engineer on the large C.P.R. irrigation works, with which he was associated for four years. In 1907 he was commissioned by the C.P.R. to lay out irrigation works in British Columbia. In the same year he laid out for a private firm the irrigation ditch now carried on by the Southern Alberta Land Company. Mr. Child was consulted during the following year upon the question of bringing water to Calgary by gravitation and relieving the ever-increasing cost of pumping from the Bow river.

In that year, 1908, he designed and partly constructed the Calgary gravity water supply system, which embraces an intake with head works on the Elbow river, about 12 miles out, and a continuous wooden stave pipe, 30 inches in diameter, banded with steel rods, laid in the ground for a distance of 10½ miles; with an auxiliary reservoir, containing 16,000,000 gallons, situated just outside the city limits, at an elevation of 220 feet. From the reservoir, for a distance of two miles into Calgary, cast iron pipes were laid to connect with the general system of the city. The intake, which is equipped with filtering appliances, is set at an elevation of 310 feet above the general city level. The hydraulic grade of the wooden pipe line was set at 1 per 1,000. Working at its full capacity this system can supply daily about 8,000,000 gallons of water to the city. Since last June the consumption of this water has been at the rate of about 5,000,000 gallons a day. In every way the installation of this system was creditable to Mr. Child, and the cost was actually $40,000 below the original estimate of $356,000.

The post of city engineer of Calgary came to Mr. Child at the beginning of 1909. His first work was designing and constructing, under the Bow river, a tunnel, 686 feet long, for conveying water to the district on the north side. This tunnel was 5 feet wide, 6 feet high, 40 feet below ground level and 26 feet below the deepest part of the river. In its construction the material encountered throughout, after getting below gravel and two feet of sandstone rock, was hard shale. No difficulty arose from water seepage and the cost of the undertaking, with 16-inch cast iron pipe, was $16,000.

The city engineer's job at Calgary is no sinecure, and every year sees Mr. Child's activities extended over a wider sphere. 1909 was in every respect a banner year for Calgary, but in none more so than in municipal work. In addition to the ordinary routine work of grading and bridging executed by the city engineer's department, there was inaugurated a street car system for which 16 miles of track were laid. Last year, 6¾ miles of paving were laid where only 1¼ miles were in existence previously. The paving is treated wooden block, sheet asphalt, bitulithic and granitoid, all of which, so far, promise well. Still more extensive schemes of development are now being carried out in Calgary, and the 13 miles of granolithic sidewalks, 12 miles of sewers and 11 miles of water mains constructed last season constitute only a portion of what is now under way and contemplated.

If we are to place any stock in what our most successful men tell us, we must regard Calgary as one of the most promising cities of western Canada. Some people are so enthusiastic about Calgary that they put it in a class by iself. In any event, the city has a future, and a great one, and we can only hope that in its success City Engineer Child will realize his best ambitions.

During 1910, permits have been issued at Winnipeg for the erection of $6,000,000 worth of new structures. At this period of the year this is another record for the western metropolis.

Personal News and Notes

Mr. J. A. Antonisen, city engineer of Port Arthur, has resigned.

Mr. John Feeney is regarded as the most likely candidate for the position of city engineer at St. John, N.B.

Montreal's permits for the first four months of the year are valued at $3,000,000—just half the Toronto total for the same period.

The city of Montreal has received the necessary authority to borrow $5,000,000 to enable it to supply filtered water to the new wards.

We regret to report the death of Mr. W. D. Hutson, roofing contractor, Toronto, which occurred last week at 350 Palmerston Boulevard, Toronto.

At the annual meeting of the Canadian Railway Club at Montreal, Mr. A. A. Maver was elected president and Mr. A. A. Goodchild, vice-president.

The town council of Welland, Ont., is contemplating the appointment of a town engineer. The post will probably be worth from $1,500 to $2,000.

At Strathcona, Alta., the value of building permits issued last month was more than double that for April, 1909, the figures being $92,275 and $43,750 respectively.

Mr. A. C. Potter, the New York expert, who is now looking over the sewerage system at Edmonton, Alta., has been asked to perform a similar service for Strathcona.

Mr. W. Anderson, of Anderson & Warden, consulting engineers, Vancouver, B.C., left last week for Peru, to report upon a hydro-electric power scheme for the Cerro de Pasco Mining Company.

The Montreal Board of Control have placed themselves on record as being opposed to the day labor system of city work. The members consider that it is both costly and extravagant in the majority of cases.

A visitor to Ottawa last week was Mr. J. S. Helyer, of Vancouver, who designed the Dominion Trust Building, Vancouver, the largest office building west of Toronto and, incidentally, the second highest building in the British Empire.

The Library Board at Hamilton, Ont., had to send a deputation to Buffalo to secure an architect to judge the plans submitted in the competition for the proposed Carnegie Library. There is another great city a little nearer Hamilton than Buffalo.

Mr. Allen Hazen, the New York filtration expert, arrived last week at Ottawa to make his report for that city. Assistant City Engineer Parsons told Mr. Hazen of how a young snake came out of a tap at Mutchmore street, Ottawa, a few days ago and of other wriggling reptiles that float through the water mains. Toronto people are not alone in their troubles.

Mr. J. J. Scully, who for several years has been district superintendent for the C.P.R. between Winnipeg and Fort William has been appointed superintendent at Moose Jaw. Mr. Scully was largely responsible for the construction of the double track between the two first named points. The change is believed to be preparatory to Mr. Scully's promotion to general superintendent with supervision over an immense western territory.

A nervy citizen of Calgary refused to heed the warning of the building inspector that his foundation work was not what the ordinance required, and proceeded making the wall, after being ordered to stop. The inspector was somewhat of the militant order himself, and proceeded to tear out the wall, without resorting to court orders. And then the aggrieved owner appealed to the city commissioners to restrain the aggressive inspector from completing the work of destruction, until a magistrate could rule upon the merits of the case.

Mr. Edwin Forse, C.E., whose death occurred at Toronto last week, was at one time one of the best known railroad engineers in Canada. He was a member of the first engineering staff engaged in New Brunswick upon the construction of the Intercolonial Railway. Later he was engaged on the C.P.R. and saw its line carried through the prairies and over the Rockies. Another great engineering work with which he was connected was the Crow's Nest Pass Railway, to which he went with Mr. M. J. Haney, and stayed till the line was taken over by the C.P.R. Mr. Forse's activities were brought to a close eight years ago, when he suffered a paralytic stroke.

At Ottawa, Ont., the proposal to have an "eight-storey" by-law is resulting in a great deal of opposition. Diametrically opposite views are expressed by two prominent architects, Messrs. W. E. Noffke and C. P. Meredith. The former thinks that the by-law would be detrimental to the value of central property and that it is easier to ventilate a high building. The latter favors the by-law and contends that it would keep Ottawa from becoming congested. "Ottawa," says Mr. Meredith, "is not like New York—on an island. It can spread as far as it likes. Eight storeys is high enough. The high building can certainly be well ventilated, but how about the low structure alongside it?"

A Growing Firm

Forty years in the same town with a steadily increasing business year by year, is the record of A. Hill & Company, steel bridge contractors, of Mitchell, Ont. The business was first started by Mr. A. Hill, sr., and was reorganized in 1894, his two sons, James and A. Hill, jr., becoming members of the firm. Since that date they have specialized in steel bridge construction work, and there is hardly a county in the province in which speciments of their work cannot be found. Within the past year or so, they constructed two large bridges, one 420 feet span over the Maitland river, in the county of Huron, which is the biggest bridge spanning that river, and another of 320 feet span over the Nottawa-Saga in Simcoe county. Mr. Hill reports business good at the present time.

Toronto Society of Architects

The annual meeting of the Toronto Society of Architects, which was held on May 3rd, brought forth many gratifying evidences of good work accomplished during the last twelve months and indications of the society's extended usefulness to the architectural profession at Toronto. From the various reports submitted at the meeting one may gather that the greatest interest shown by the members was manifested in the question of obtaining improved facilities for architectural education. While progress in this department has been comparatively slow in recent years, the society finds ample cause for encouragement. The election of officers resulted as follows: President, Mr. C. H. Acton Bond; Vice-president, Mr. J. C. B. Horwood; Secretary, Mr. P. B. McGiffin; Treasurer, Mr. A. H. Cassels; Committee, Mr. J. P. Hynes and Mr. S. G. Beckett.

Advanced Finishes for Modern Building Construction

The evolution of materials, during recent years, for protecting and decorating concrete and steel structures and the advanced finishes that are now available in this line are matters well worthy the careful study of every progressive architect, builder and engineer, in that without such study one is liable to specify the imitation for the reality and to employ a preparation that is as detrimental to the material as the genuine article is beneficial. By many of those who are most competent to judge, the "Glidden" quality in such materials is considered the standard of excellence. The word "Glidden" is derived from the Glidden Varnish Company, Cleveland, Ohio, a concern the merits of whose products are already widely known in Canada and almost universally recognized in the United States.

Among the various lines manufactured by this company may be mentioned their alkali proof wall size, a material that is intended, especially, to prevent discoloration and staining of decorative materials used upon plaster and cement surfaces. Upon application it penetrates the porous surface and protects the wall coating. It can also be used for backing up granite, limestone and other high class building materials, with a view to the prevention of staining and discoloration of exposed surfaces. The space covered is 300 to 400 square feet to the gallon, according to the surface.

Another product that has a strong claim to merit is the Glidden concrete floor dressing, one of the best materials on the market for the protection and maintenance of concrete floors. This material covers 200 to 300 square feet to the gallon for the first coat and 300 to 400 square feet to the gallon on the second coat, according to the surface.

There is a great demand in Canada just now for satisfactory waterproof concrete finishes. In this department the Glidden firm can provide a solution for every kind of problem. Their liquid cement is a very high quality of cement incorporated with a waterproofing medium of unusual durability and water-resisting qualities. It is made in imitation of Bedford sandstone in a variety of practical shades and is intended especially for waterproofing cement, stucco, plaster, and concrete surfaces, with a view to producing decorative effects. Its covering capacity varies from 150 square feet to the gallon and upwards, according to the condition of the surface

For use upon plaster, brick, cement, tile, iron and wood surfaces there is the Glidden waterproof white finish, a material whose special function is to intensify the radiation of light in hallways, elevator shafts, and so on. The white finish covers 300 square feet and upwards to the gallon.

Architects perhaps will be most interested in the French Caen stone finish, manufactured exclusively by the Glidden Varnish Company, and widely used with the most satisfactory results. This finish was specified for the Hotel Ritz, the most exclusive hostelry is Paris, the Hotel Carleton in London, and the beautiful Hotel Belvedere, the National Marine Bank and the Metropolitan Savings Bank, all in Baltimore.

The company also manufacture French Caen stone tints, which are of delicate colors and produce the most harmonious effects when employed in conjunction with the French Caen stone finish.

Among the many other products of this concern may be mentioned their waterproof flat finishes, transparent waterproofing, acid and graphite acid proof coating, liquid concrete and liquid rubber.

Further information in connection with all of the above materials, and specifications therefor, may be obtained in handy booklet form upon application to the Glidden Varnish Company, Cleveland, Ohio.

Rendering Interior Walls Damp-Proof

In regard to an effective method for impregnating walls in the interior of buildings, such as basements, ground floors, subterranean passages, etc., against dampness and fungus growth, the "Painters' Magazine" contains the following in reply to a question:

A washable coating for this purpose that may be applied to any surface previously cleaned by scrub brushing to remove dirt, loose mortar, etc., is prepared by dissolving 100 pounds of a special soap produced by the saponification of stearic acid with soda in 6 pounds of 66 per cent. alcohol. Where first coat is no object this coating will produce the most durable results, as it will give a very hard surface that may be cleansed from dust, etc., by brooming or brushing and may be washed with hot or cold water frequently without disintegrating the constituents of the soap, as would be the case with an aqueous solution. The use of the alcohol permits a greater penetration of the soap, and it is not necessary to confine the use to 66 per cent. alcohol, for the stronger the spirit the better the result.

This foregoing formula is to be highly recommended for falls of living rooms where dampness is liable to exist. For cellars, sub-cellars, basements, stables, etc., the ordinary soaps, made from any kind of fat or oil, with or without resin, may be employed and the cost very much reduced thereby, but the stronger the spirit used the better. The proportion of soap and spirit is best determined by trial on a small scale. Unless soft soap is used the soap should be sliced very thin and placed in warm spirit, which is best heated on a sand bath or on a radiator. The kettle in which the solution is made should be well covered and the contents stirred occasionally. High heat is not necessary.

Either solution may be colored by spirituous solutions of aniline colors or by directly mixing with mineral colors such as are unaffected by alkalies, such as yellow ochre, Venetian red, ultramarine blue or green, oxide of chromium green, etc., whereby at little extra cost some attempt at decoration may be had. A very important feature is that fact that to these spiriuous solutions may be added liquid disinfecting chemicals for hygienic purposes, as in stables for sick animals, etc. These coatings may be applied to raw woodwork, brick or stonework, cement or concrete plastered walls or whitewashed surfaces. On calcimined coatings it will not answer, unless the latter is fixed with a 5 per cent. acqueous solution of chrome alum, but on oil paint the spirituous soap solutions will not hold. In order to make operation more simple it is best, when the surfaces to be impregnated consist of lime or of stone containing lime or of rough cast, to coat them first with baryta water or waterglass, and, after permitting these to become dry, to wash off the excess with hot water.

Mayor Hopewell, of Ottawa, has laid before the C.P.R. officials a scheme for providing communication between the union depot and the centre of the city by means of a series of bridges extending over the Ottawa river from the foot of the canal to Victoria Island. The proposition which the C.P.R. has on hand, and for which plans have already been prepared, is the construction of an underground tunnel from the Rideau canal to the central stations at a cost of $1,000,000 or more. The project is an extensive one and if carried into effect will greatly improve the railroad transportation system of the federal capital.

Vancouver builders are easy marks. The latest thing to which they have submitted is the introduction of a card system by the Building Trades Council. It is stated that cards signifying that only union men are employed have gone up on every large building now under construction at Vancouver.

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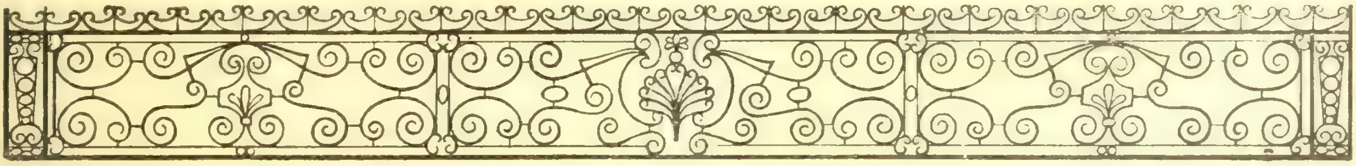

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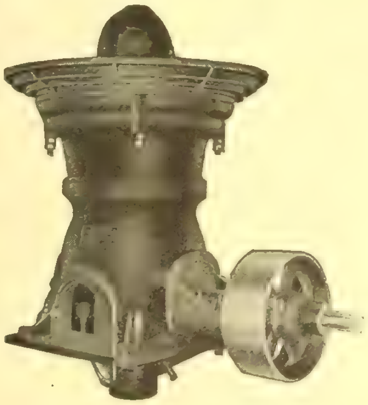

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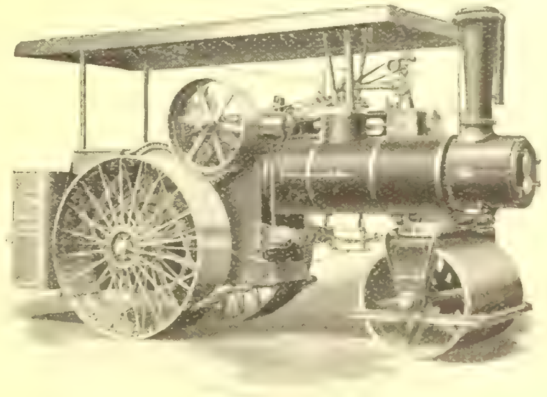

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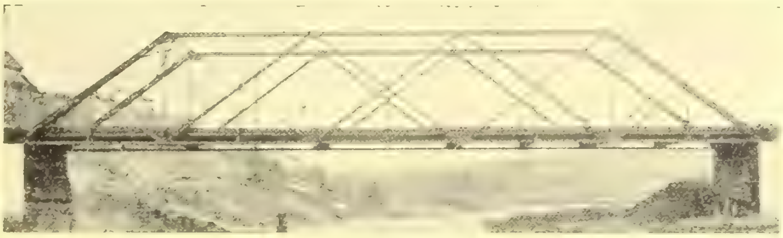

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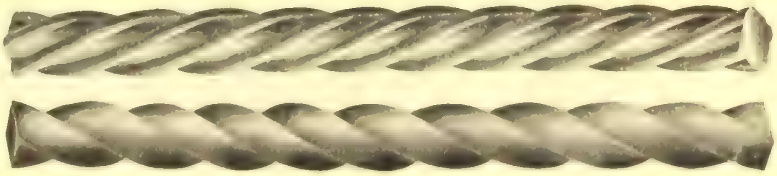

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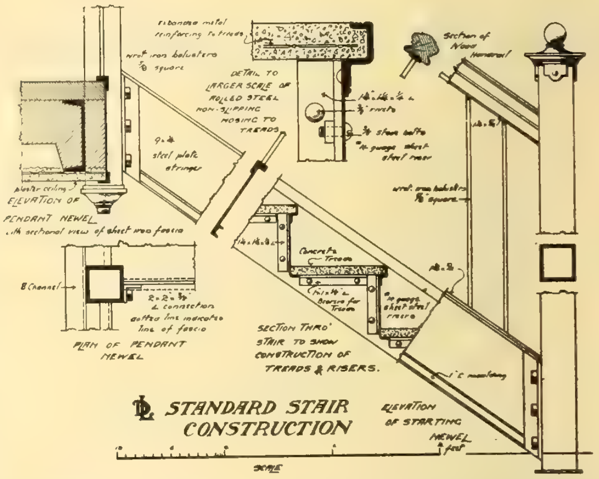
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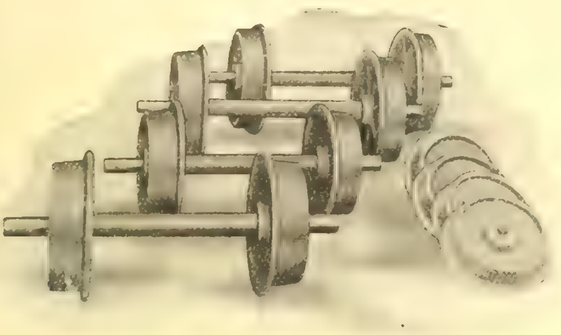

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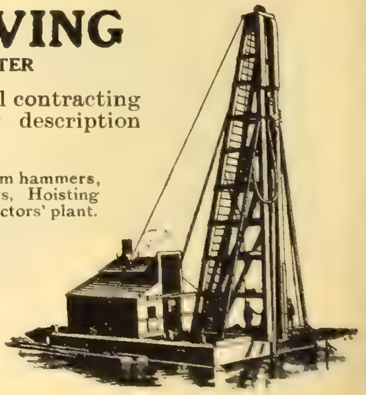

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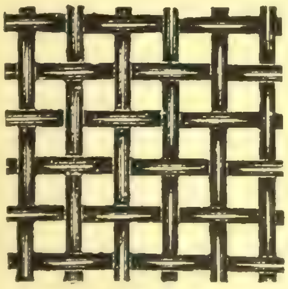

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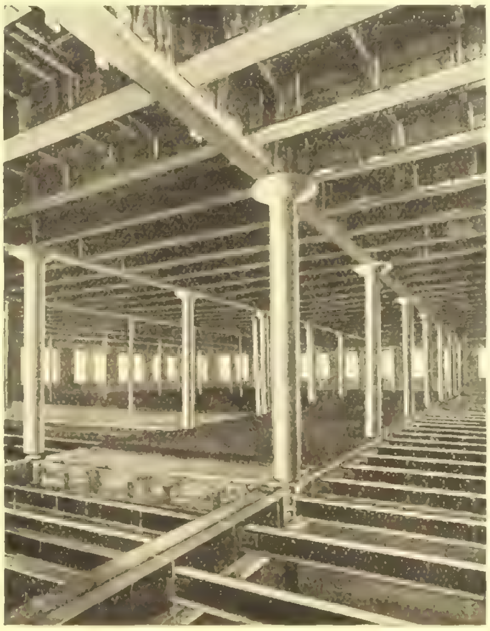

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No. 1 enamelled bricks, all colors, from $80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D,D.
10 to 25 united inches	$4.25	$ 6,25
26 to 40 "	›4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i,	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	.,..	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex, and 3-16 inch round, 58 cents per square foot up.
Floor Tile—½-inch square 65 cents.
Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to color 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, firsts 70 cents.
Capping Coves and corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.

Boilers—Galvanized Iron Range,

30-gallon, standard, $4,50; extra heavy, $7.00.

CastIron Sinks.

16 x 24, $1.00; 18 x 30. $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per pound; traps and bends, 50 per cent

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

7 and 8-inch pipe, 40 per cent.
Light pipe 60 and 10 per cent; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL. Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b, Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto,
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3,50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per thousand.
Steel channels and beams, $2.75 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents,
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $10.50; sanded $5.50;; universal finish, $15.50.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $7.50 to $8.00 to $9.00 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs,
Boiled Linseed Oil, in barrels, $1.00 per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 97 cents per gallon of 9 lbs.
Turpentine, in barrels, 81 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Martel & Langelier, engineers' and plumbers' supplies, etc., Ottawa, have dissolved, J. A. Langelier continuing.

Lacroix & Dubord, contractors, Montreal, have dissolved

J. E. Trepannier, painter, Ottawa, is retiring from business.

J. B. Furniss, hardware merchant, Sunderland, Ont., is advertising business for sale.

L. Tompin & Son, hardware merchants, Ste. Agathe, Man., have been succeeded by J. [illegible]

David Wheaton, lumber merchant, Midgic, N.B., is deceased.

Austin Lumber Company, Cap. St. Ignace, Que., have sold part of assets.

Belanger & Company, contractors, Lachine, Que., have dissolved

M. McIntyre, lumber merchant, Phoenix, B.C., has sold out to C. A. Ross.

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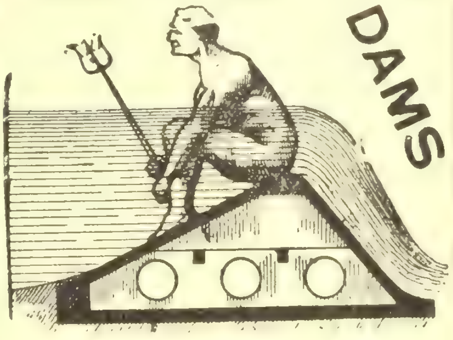

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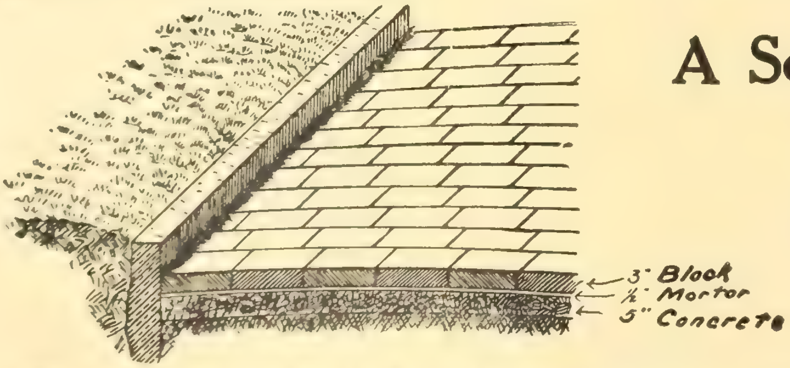

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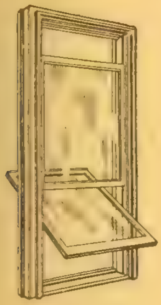

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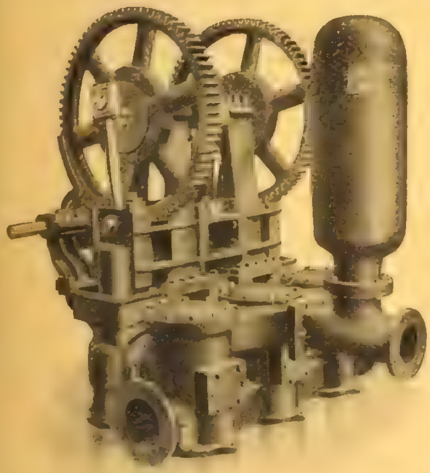

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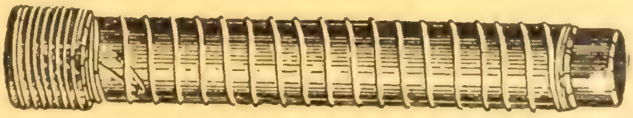

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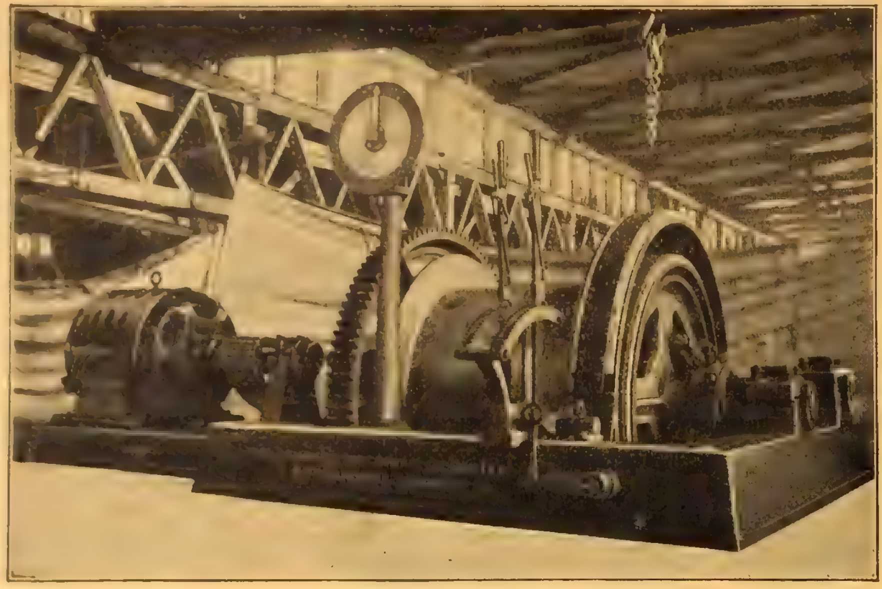

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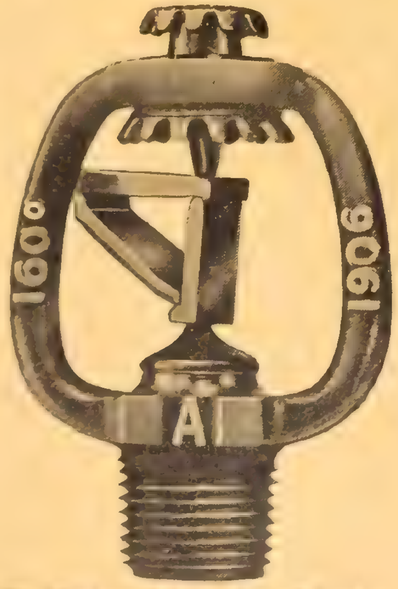

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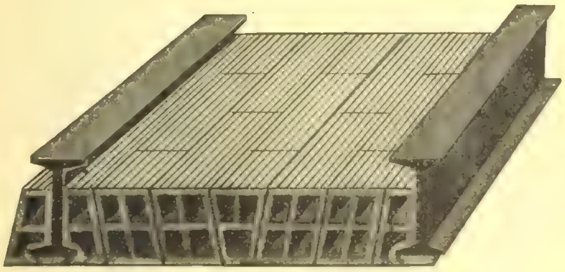
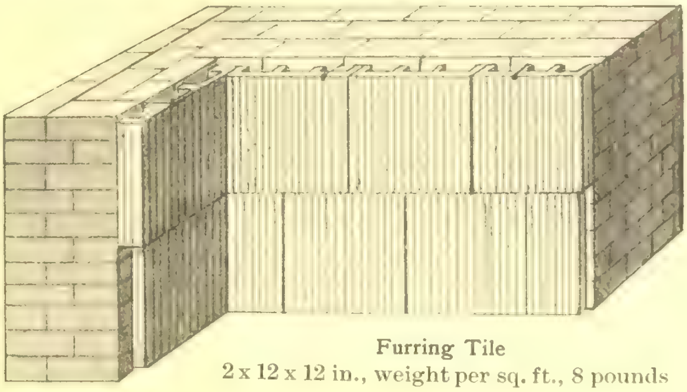


Perspective of Typical Arch



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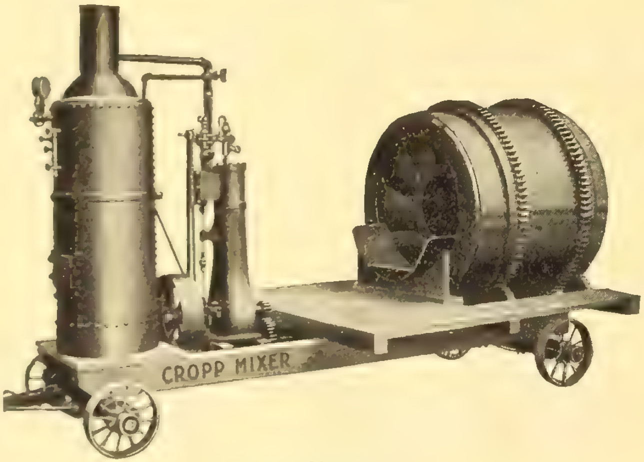
Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

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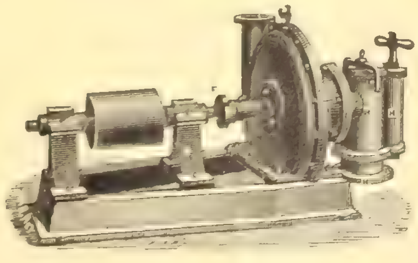

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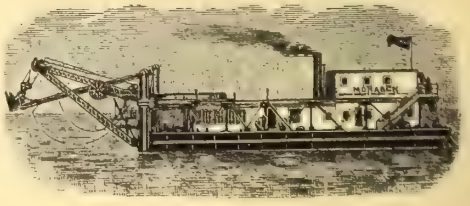
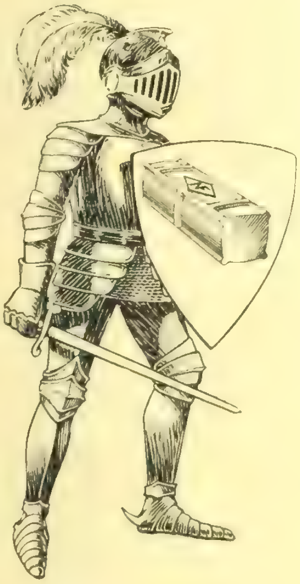
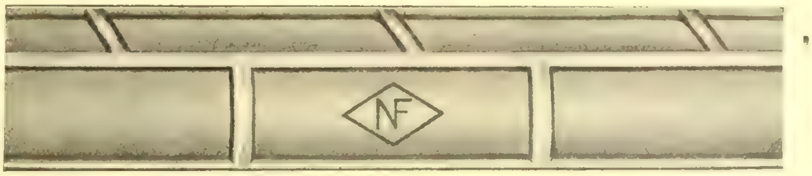


The Bar With the Brand is Your Protection





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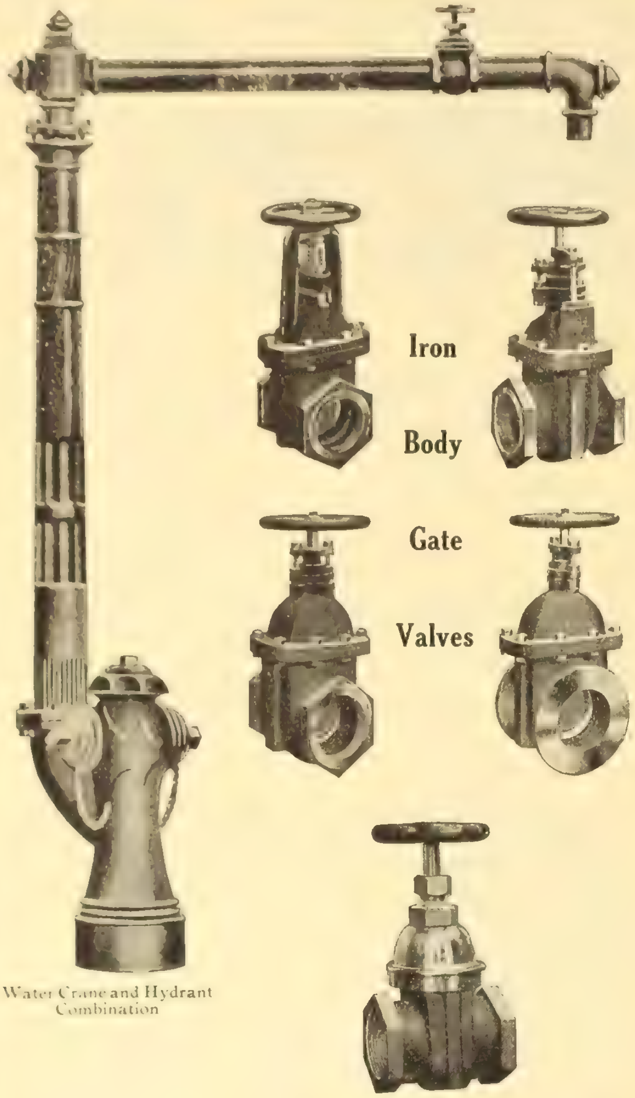

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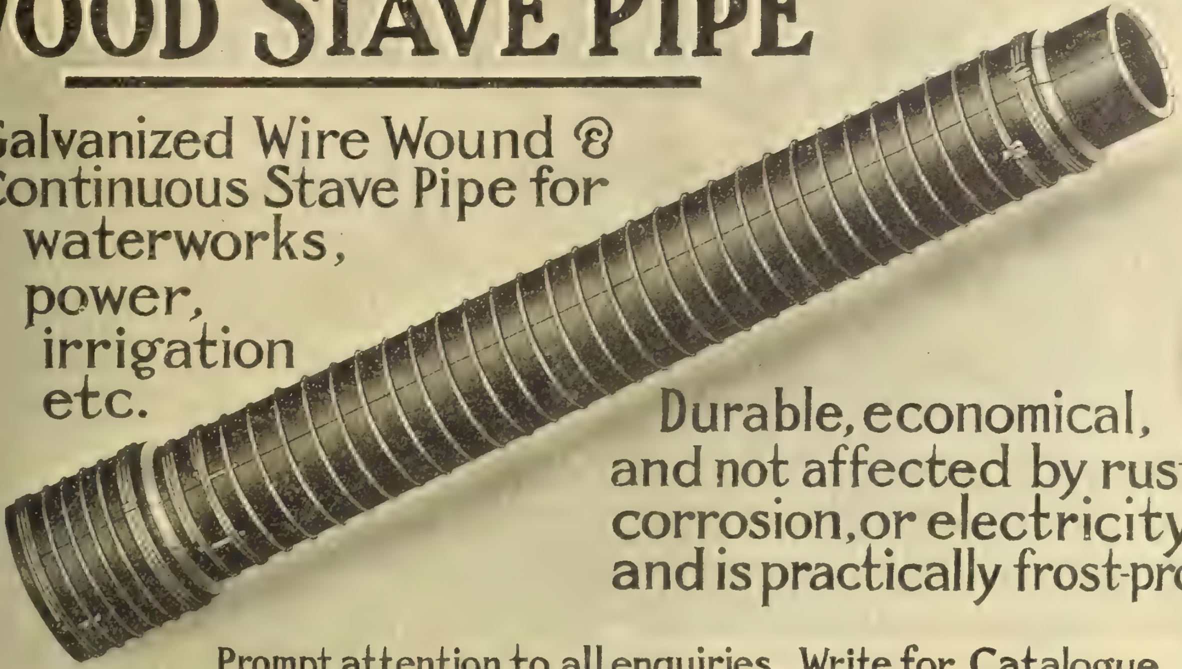

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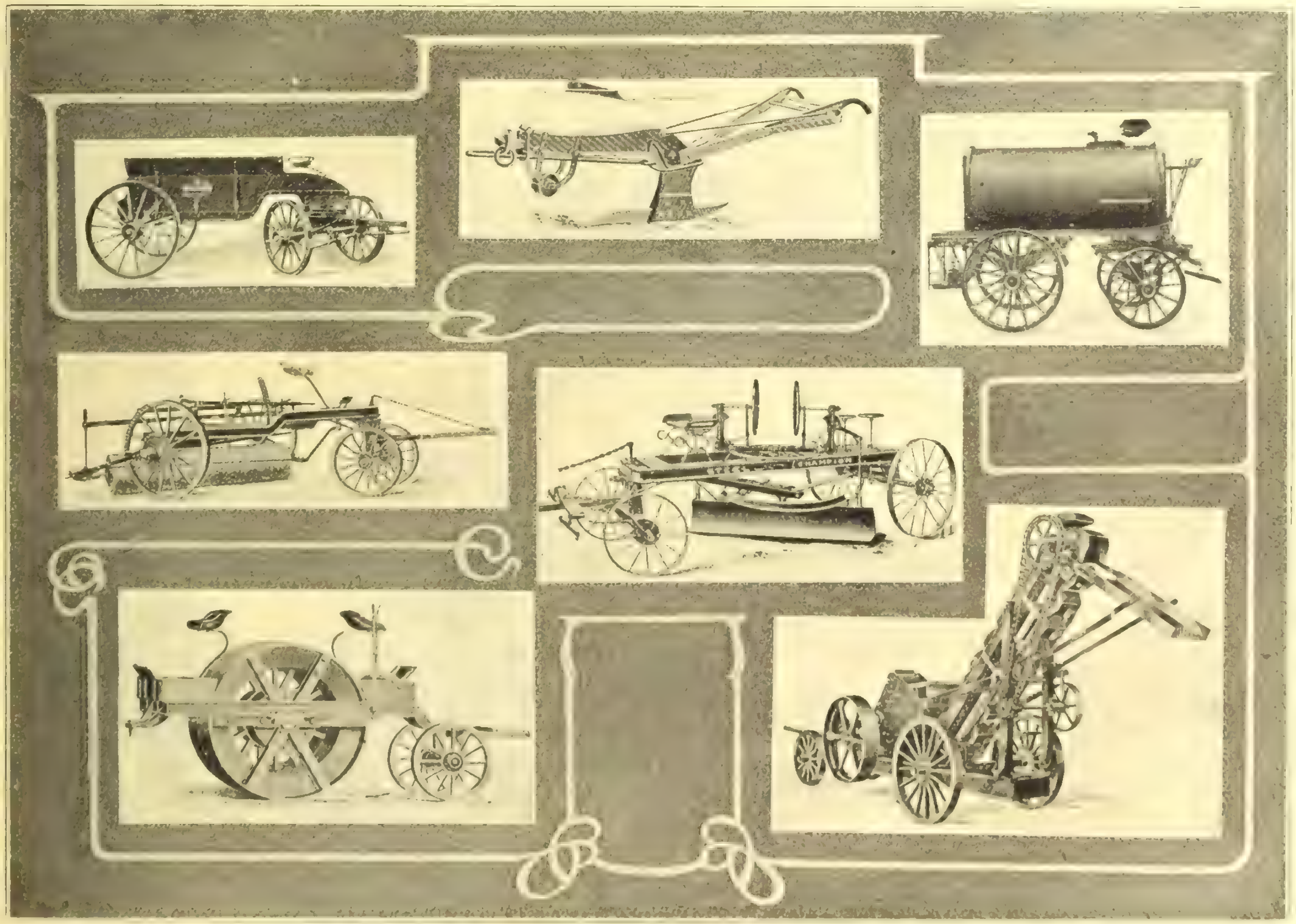

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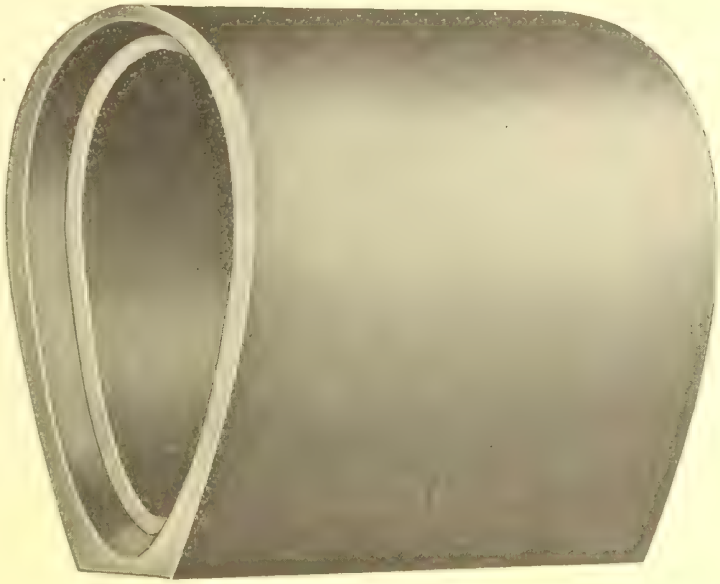
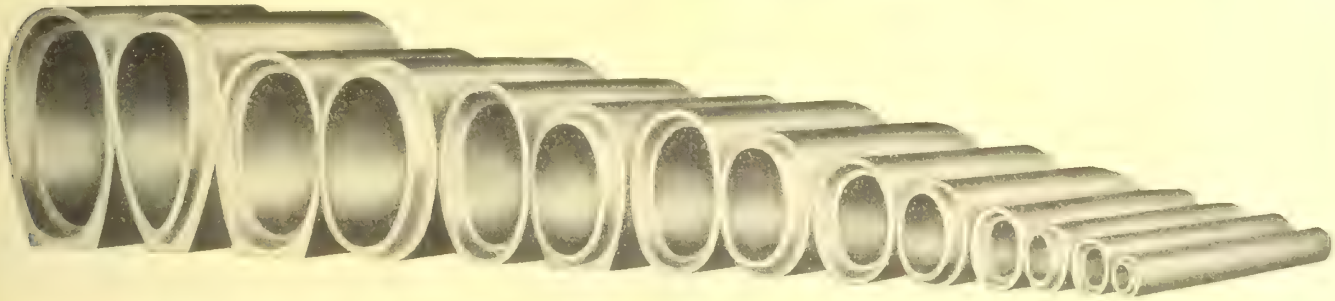
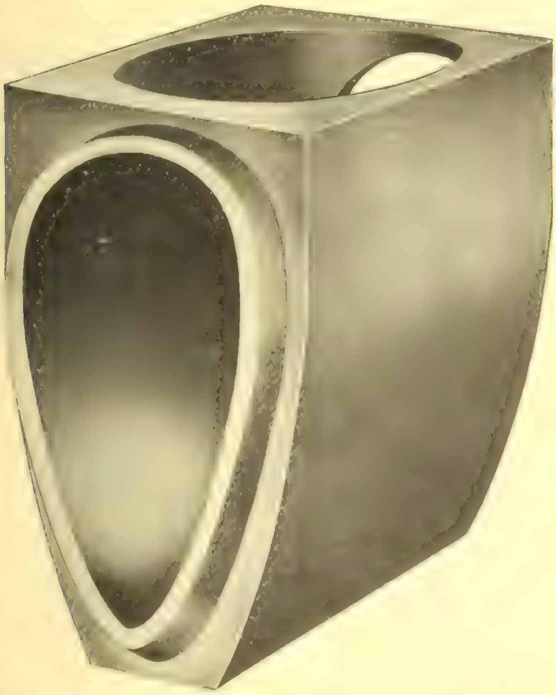


Section of 2' x 3' pipe.





Man-hole Section of 2 x 3 pipe.

Concrete sewers abound in England and Germany. The modern sewers of Paris are all of concrete. American cities have adopted it. Brooklyn has hundreds of miles of it with not a single failure, whereas even Scotch vitrified pipe has been found to have deplorably failed there. Toronto, after much hesitation, is now in line with concrete. Why be the last to join the ranks you eventually will and must join?

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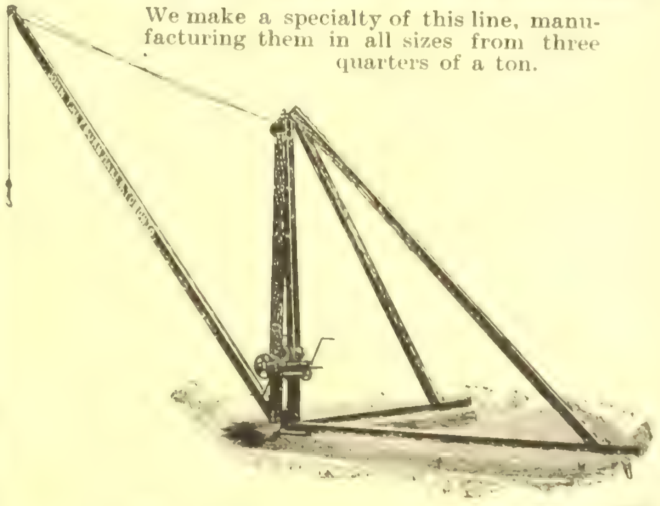

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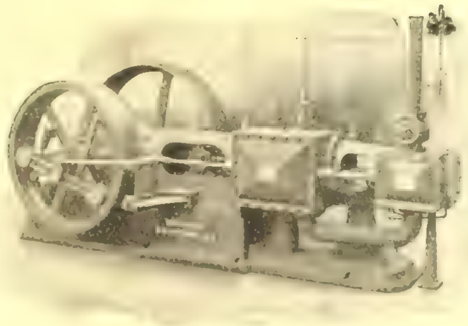

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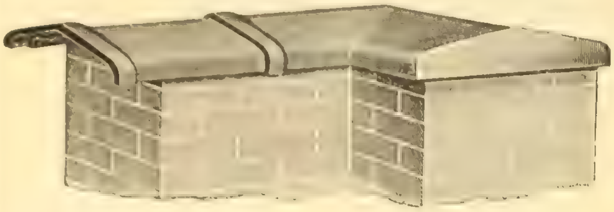

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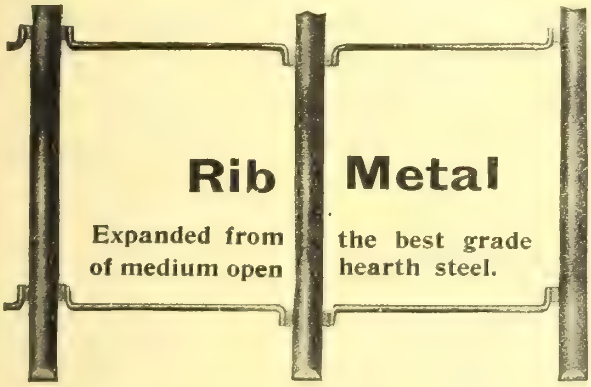

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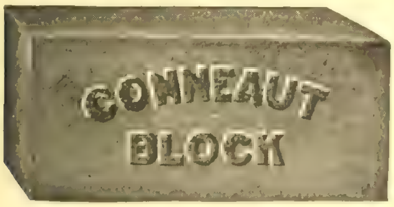

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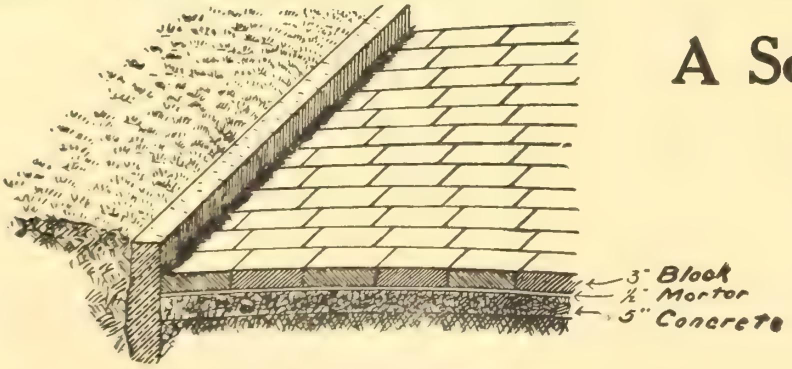

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Cornwall, Ont.

Tenders will be received until May 31st for the construction of the Johnston drain; also for four reinforced concrete culverts. Jas. R. Simpson, Township Clerk, Finch, Ont.

Dauphin, Man.

Messrs. Chipman & Power, of Toronto, have been engaged as designing and superintending engineers in connection with the proposed waterworks and sewerage systems.

Fort William, Ont.

This municipality is calling for tenders until June 3rd for constructing sewers on several of the city streets. (See advertisement in "Tenders and For Sale Department" of this issue.)

The council have authority to borrow $474,466.39 to be expended on public works. Of the local improvement fund, $140,000 will be spent in the construction of sewers outlined as follows: Francis street, $53,350; Amelia street, $13,000; Edward street, $6,380; May street, $9,350; Brodie street, $9,680; May street, $10,670; Dease street, $2,000; Brodie street, $7,370; McKenzie street, $1,900; Rowand street, $3,500. Other sewer construction, $22,600. Paving to cost $80,000 is authorized as follows: Victoria avenue, $27,000; Syndicate avenue, $34,500; Syndicate avenue, $18,500. For concrete sidewalks in Victoria avenue and elsewhere $7,500 will be expended. For plank sidewalks, $15,000 is the estimate. Grading is estimated at $2,000, macadam at $7,500, boulevards at $7,500, and sewer construction at $9,500.

Galt, Ont.

The by-law to provide $5,000 for waterworks extensions was carried.

Kamloops, B.C.

The new reservoir by-law received a six months' hoist.

Kaslo, B.C.

The council proposes to introduce a by-law for the purpose of borrowing $25,000 for sidewalks and other improvements.

London, Ont.

Tenders are invited for a steel tower estimated to cost [illegible]. Chairman [illegible], Water Commission.

Lachine, Que.

The Lachine Council is preparing a by-law for the purpose of raising a further loan of $28,000 for the [illegible] of public works, especially roads and sidewalks.

Moncton, N.B.

Tenders addressed to J. Edington, city engineer, will be received until May 28th for construction of sewer and catch basins on Lewisville road. Plans, etc., at office of city engineer.

Melville, Sask.

Plans for a waterworks and sewerage system are under way.

Montreal, Que.

The city of Montreal will construct four public lavatories at various points throughout the city. The Board of Control will order plans and specifications to be made shortly.

New Westminster, B.C.

An extensive system of street improvements, to cost about $800,000, will shortly be started. The city engineer is engaged on specifications for about five miles of paved streets. Tenders are now being called for two miles of cement sidewalks.

Ottawa, Ont.

Ttenders addressed to the chairman, Board of Control, will be received until June 2nd for asphalt and block pavement on Bank street, from Pretoria avenue to Wilton crescent; St. Patrick street, from Dalhousie street to Rideau river. Specifications at office of the City Engineer, N. J. Kerr.

Prince Albert, Sask.

Tenders will be received until June 11th for two return tubular boilers. C. O. Davidson is city clerk. (For further particulars see "Tenders and For Sale Department" of this issue.)

Regina, Sask.

Tenders will be received until June 6th for the following debentures: $10,000 30 years waterworks; $10,000, 30 years sewers, each at 4 1-2 per cent.

Toronto, Ont.

Tenders are being called by the Board of Control until May 31st for pavements, kerbs, concrete walks, sewers. Specifications at office of City Engineer. G. R. Geary, chairman.

Vancouver, B.C.

A project of great importance to Southern British Columbia is announced by the Hon. Thos. Taylor, Minister of Public Works, who is now in the interior looking into the question of a trunk wagon road through the southern part of the province. When this is completed it will extend from Vancouver to the Crow's Nest, a distance of 750 miles. The Alberta Government is already co-operating with this province by a trunk road in the south to connect with the B. C. road at the boundary in the pass.

Welland, Ont.

It is stated that the ratepayers will vote on a $13,000 sewer by-law on the 20th June.

The Water Commissioners have recommended to council the submitting of a by-law to raise for waterworks improvements [illegible], the amount estimated by Engineer Kennedy, of Montreal.

Tenders addressed to the chairman, Board of Works, will be received until June 1st for construction of granolithic walks, [illegible]. [illegible] Patterson, secretary, Board of Control.

AWARDED.

Berlin, Ont.

H. J. Bowman, county engineer, sends us the following list of tenders: 35 foot concrete arch, to Pipe and Campbell, for [illegible]; others tender, M. M. Hiles, $1,092; J. B. Lickty, $1,200; Walter Davies, $1,213; Fraser & Clemens, $1,283. Concrete floor on bridge, near Ayr, to Hamilton Bridge Works Company, for $387; others tenders, Pipe & Campbell, $395; J. B. Lickty, $410; Walter Davies, $480; M. M. Hiles, $480.

Bridgeburg, Ont.

Geo. Ross, consulting engineers, Welland, sends us the following item re sewers, etc.: The tenders for the construction of the Bridgeburg Sewerage Works, consisting of about 10,000 lineal feet of vitrified sewer pipe running from 8 to 24 inches in diameter, with manholes and all sewer appendages, three septic tanks 70 feet long, 12 feet wide and 6 feet deep, a 24 inch cast iron outlet 180 feet in length, have been opened and contract was awarded to Mr. John F. Connolly, of Toronto, at the price of $23,700. The lowest bid received was $18,990.05; others bidders were Peter Lorenzo, Niagara Falls, $28,240, and A. C. Stewart & Company, Winnipeg, $35,500. Valves for septic tanks and the cast iron pipe for outlet in river to be furnished to the contractor and $3 per cubic yard extra to be allowed for rock requiring to be blasted.

Campbellton, N.B.

The following tenders were received for putting in the pipe on wharf: W. H. Wallace, $356.40; S. D. Harriman, $310.34 (accepted).

Fernie, B.C.

For supplying the city with 5 miles of sewer pipe and 2 1-2 miles of water pipe, William Dicken, of Fernie, secured the contract at the following prices for concrete pipe: 6 inch, 25 cents; 15 inch, 70 cents; 20 inch, $1.25; 24 inch, $1.70; 30 inch, $2.95; bulk tender, $21,643.60. Other bulk tenders were: Blackmer Post, St. Louis, Mo., $23,670.72; H. H. Depew, Fernie, $25,230.45. Mr. Dicken is the manager of the Western Canada Pressed Stone & Concrete Pipe Company.

Montreal, Que.

The Board of Control have awarded contracts for the construction of sewers as follows: Trunk sewer in Laurier Ward, from head of St. Lawrence street to Back River, to L. Giguere & Company at $115,855, the highest tender for this work being$176,000; No. 3 section Sherbrooke street sewer, St. Lawrence to Bleury street, to M. Dineen, at $13,730, the highest tender being $49,000 approximately; only one tender was received for the construction of the sixth section of Sherbrooke street sewer, from Drummond to Guy street, from M. Dineen, at [illegible].

Vernon, B.C.

The contract for sidewalk construction has been awarded to Worswick Paving Company, Limited, which is planning to locate a plant in Victoria.

Walkerville, Ont.

C. H. Robinson, town clerk, sends us the following list of [illegible]: The Cadwell Silica Stone Company, Windsor, $4,194.71; D. M. Mitchell, Niagara [illegible], $[illegible]. Thos. Chick, Windsor, $4,[illegible]. Davis Todd & Company, Windsor, [illegible]. Contract awarded to The Cadwell Silex Stone Company. (2) Sewers, Thos. Chick, Windsor, $[illegible]. John Conn, Windsor, $[illegible]. G. W. Sewell, Windsor, $7,[illegible]. Semmite Bros., Detroit, $9,356. Contract awarded to Thos Chick.

Yorkton, Sask.

The amount of contract for sidewalk construction late given to C. Mattaini, general manager Guelph Concrete Manufacturing Company, Fergus, we are informed, is $18,000. Noted in last issue.

Railroads, Bridges and Wharves

Angers, Que.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, will be received until June 17th for construction of wharf at this place. Plans, etc., at this Department and on application to local postmaster.

Ellice, Man.

Tenders are being called by this municipality until June 21st for $5,000 10-year bridge debentures, at 5 per cent. H. Tillman, secretary-treasurer.

Halifax, N.S.

F. A. Ronnan & Company have been awarded a contract for the construction of a railway siding, one mile long, from the Intercolonial Railway main line near Rocky Lake, to the Acadia Powder Company's works.

Joggins, N.S.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until June 10th for construction of an extension to the breakwater here. Plans, etc., at above Department and at the offices of C. E. W. Dodwell, Halifax, E. G. Millidge, Antigonish, and on application to local postmaster.

Kenora, Ont.

The proposition of cost for subway has been arrived at between the town, the C. P. R. and the Government, and it is stated that construction will commence at an early date. Estimated cost, $17,000.

Kingsport, N.S.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ont., will be received until June 13th for construction of extension to pier here. Plans, etc., at above department, at the office of C. E. W. Dodwell, Halifax, and on application to local postmaster.

Montreal, Que.

It is stated that the C. P. R. will this season put up immense steel structures as snow guards in the Rocky Mountains. Plans of the new structures have been prepared.

New Westminster, B.C.

It is stated that large car building shops will be established on this coast by the C. N. R. and that the site will likely be opposite the mills of the Fraser River Lumber Company.

North Vancouver, B.C.

It is reported that the G. T. P. has purchased block 266 with the intention of ultimately using the property for terminal yards. E. J. Chamberlain, general manager, is in the west.

Ottawa, Ont.

Plans are being prepared at the Railway Department for the big bridge over the Saskatchewan river in connection with the Hudson Bay Railway, and as soon as completed, tenders for the structure will be called.

Ottawa, Ont.

The Montreal, Kapatchawan & Rupert Bay Railway Company have secured a charter from the Dominion Government with a substantial subsidy of $6,200 per mile and assistance to the bridge along the route amounts to $2,500,000. Work will be started immediately for the construction of the line, which will run from Bark river to Lake Kapatchawan, on the Grand Trunk Pacific, a distance of 194 miles. Assistance has been promised by the Provincial Government. The capital of the company is $3,000,000, and a bond issue at the rate of $30,000 per mile is authorized by the federal charter.

Regina, Sask.

Tenders are being called for $41,000, 30-year debentures, Albert street subway, at 4 1-2 per cent. A. E. Chivers, City Clerk.

Sackville, N.B.

Tenders for new public wharf will be called shortly. Geoffrey Stead, C.E., Chatham, district engineer.

Sault Ste. Marie, Ont.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until June 20th for extension to Government wharf here. Plans, etc., at office of J. G. Sing, district engineer, Toronto, and on application to local postmaster.

St. Leonard's, N.B.

A new bridge, to cost $75,000, is to be built at once across the St. John river, between Van Buren, Me., and here, the cost of which has been provided, one-half by the Maine Legislature and the other by the Dominion and Provincial Governments. If the bridge is intended to support railway traffic it will very naturally connect the Bangor & Aroostook system not only with the Canadian Pacific road but with the new branch of the Intercolonial, now being built across New Brunswick from Campbellton on the Intercolonial road to St. Leonards.

St. Thomas, Ont.

Jas. A. Bell, county engineer, will receive tenders till June 8th for the construction of a reinforced concrete arch bridge over Kettle Creek. (For further particulars see "Tenders and For Sale Department," this issue.)

Toronto, Ont.

Tenders are being called by the T. & N. O. Railway Commission until June 8th for work in connection with the work necessary for construction of Nipissing Junction spur. See advertisement in this issue.

Vancouver, B.C.

It is stated that plans have been drawn up by Engineer Moss, in charge of the engineering business of Waddell & Harrington, for a $500,000 steel viaduct, about 2,500 feet long, which it is proposed to press upon the city council to erect from the foot of Georgia street.

Vancouver, B.C.

The deal for the acquisition by the G. N. R. of all the property west of Gore avenue on Prior street and for all the Park Lane lots, it is stated, has been closed. W. Holden, acting broker. E. A. Howard, G. N. R. representative.

AWARDED.

Stewart, B.C.

A contract for supplying the piles for the Portland Canal Short Line Railway has been awarded to Messrs. C. Hickson & Company, delivery being fixed for May 20. Mr. James McDonald, of Victoria, has secured the contract for building the dock and approach.

St. Charles de Caplan, Que.

Messrs. Burns & Charleson, of Ottawa, have been awarded the contract for a new wharf at St. Charles, Quebec. Cost, $15,000.

Public Buildings, Churches, Schools, etc.

Arnprior, Ont.

A by-law has been passed to issue $14,000 school debentures. Thevor H. Trout, clerk.

Beaverton, Ont.

Tenders will be received until June 10th for $7,000 4 1-2 per cent. 20 years, town hall debentures. C. A. Patterson, clerk.

Charlottetown, P.E.I.

Tenders will be received by A. Beaton, until June 6th, for repairing Brookfield Hall. Plans, etc., with above mentioned.

Coquitlam, B.C.

Tenders are being called by the Public Works Department, Victoria, for the erection of a brick house for engineer and pump station.

Calgary, Alta.

On May 25th a by-law will be voted on to issue $126,000 4 1-2 per cent. 30-year City Hall debentures. H. E. Gillis, City Clerk.

Carleton Place, Ont.

The following represent some of the losses in connection with the fire on the 18th inst.: Zion Presbyterian Church, $35,000; manse, $2,000; St. Andrew's Presbyterian Church manse, $2,000; Masonic Hall, $3,500; drill shed and armories, $30,000; curling rink, $2,500.

Dundalk, Ont.

A by-law has been passed providing for the issue of $5,000 5 per cent. school debentures. M. W. Ridley, clerk.

Barrie, Ont.

F. S. Baker, architect, Traders Bank Building, Toronto, will receive bids up to June 1st for plumbing and heating for Royal Victoria Hospital. (For further particulars see "Tenders and For Sale Department" in this issue.)

Edmonton, Alta.

A second offer of a site for the proposed Ladies' College to be established in connection with the Presbytery of Alberta, has been received by Dr. D. G. McQueen.

By-law for public library site passed and commissioners were requested to secure options on College avenue site.

Fernie, B.C.

The erection of the new Christ Church will be commenced at once. Noted in May 11th sisue.

Fort William, Ont.

The council have authority to borrow $12,015.43 to be applied to high school; $38,997.77 to public school; and $8,736.08 to separate schools.

Gretna, Man.

A by-law will be voted on to issue $12,000 5 per cent. 20-year school debentures. Harry F. Stirk, secretary-treasurer, Gretna, S. D. No. 336.

Guelph, Ont.

Wellington county council have decided to erect a new courthouse to cost $50,000 or $60,000.

Hicksvale, Sask.

Tenders were taken for the erection of

Fairview School. R. J. Brown, secretary, Hicksvale.

Hamilton, Ont.

At the annual Y. M. C. A. meeting a committee composed of J. F. Walker, H. Banwell, C. P. McGregor and others was appointed to report on the proposed addition to east end and possible building campaign.

At a citizens' meeting it was decided to erect a Sick Children's Hospital in memory of the late King Edward. Rev. Canon Abbott, Thomas W. Watkins and Sheriff Middleton are interested. Amount on hand, $5,000.

Kenora, Ont.

The plans for a new citadel building for the Salvation Army have been completed and call for an up-to-date structure of red brick.

Lindsay, Ont.

Tenders for the construction of a porch and granolithic steps at the county jail will be received until Monday, May 30th. J. R. McNeillie, county clerk.

Lytton, B.C.

Tenders are being called by the Public Works Department, Victoria, for the erection of a lock-up and court-room here. Plans, etc., at offices of the constable at Yale, Lytton and Ashcroft, and at the above Department. F. C. Gamble, Public Works Engineer.

London, Ont.

There is a possibility that the Y. M. C. A. here may have a new building in the near future.

Midland, Ont.

Competitive plans will be received until May 28 by Thos. I. Trueman, secretary-treasurer Public School Board, for erecting a 4 room brick school.

Moose Jaw, Sask.

Plans have been secured for an isolation hospital. W. F. Heal, city clerk.

Medicine Hat, Alta.

Tenders closed for erection of a concrete block wing to the Woman's Hospital. E. J. Fewings, secretary. W. T. Williams, architect.

Montreal, Que.

A movement is on foot to raise sufficient money to erect a new hospital for infants to supplant the present overcrowded building at 43 Argyle avenue.

It is stated that the Sparrow Amusement Company contemplate the erection of a new theatre building at an early date.

Plans are now ready for the new central Y. M. C. A. building to be erected on Drummond street at a cost of $300,000; also for the Westmount branch, corner Arlington avenue and Sherbrooke street; the Fairmount branch, corner Park avenue and St. Viateur street. Tenders will be called shortly. Ross & Macfarlane, architects.

The Montreal Art Association has engaged Mr. Edmond Wheelwright as consulting architect of the proposed building to be erected on Sherbrooke street. Three firms have been selected to compete for the new building, viz., Brown & Vallance, Percy E. Nobbs and E. & W. S. Maxwell.

It has been suggested that as a fitting memorial to his late Majesty King Edward VII. that a musical hall with a seating capacity of at least 5,000 should be erected in Montreal. It is also suggested that the Redpath Estate on Sherbrooke street be purchased and devoted to a central approach and entrance way with boulevards, etc., to Mount Royal Park.

The Grey Nuns have purchased the property at northwest corner Sherbrooke and St. Lawrence, Main street, known as Belmont Hall, and, it is stated, will hold this for building purposes.

Tenders have been received for the painting and glazing of an extension to the Public Library of Westmount. Mr. Robt. Findlay, architect.

Tenders will be received until May 26th for the erection of church building at South Bridge, Mass. Mr. Jos. Venne, architect.

Mr. Alphonse Venne and J. A. Godin were the successful architects in the competition for plans of decorations to be erected in connection with the Eucharist Congress to be held in Montreal during the coming autumn. Tenders are being received until May 25th for the carpentering work, plastering, painting and decorating of the above by Mr. Jos. Venne, supervising architect.

Neepawa, Man.

M. H. Fieldhouse, Neepawa, has plans for new church at Salisbury.

New Westminster, B.C.

Over $97,500 for the erection of three new schools will be raised by debentures shortly.

North Vancouver, B.C.

Competitive plans for a school on Lonsdale avenue were called on the 27th inst. For further information address Alex. Law, Box 178 North Vancouver.

Peterborough, Ont.

Tenders are being received by W. J. McColl, rector, St. Peter's Cathedral, until May 30th for construction of additions and alterations to Mount Joseph Convent. Plans, etc., at office of J. E. Belcher, C.E., Diocesan architect.

Orillia, Ont.

It is probable that the Department of Education will establish a Model School here. Dr. Merchant, Toronto, Chief Public School Inspector.

Ottawa, Ont.

La Salle Academy, Sussex street, was damaged to the extent of about $5,000 on the 18th inst.

Tenders addressed to N. Tessier, secretary, Department of Public Works, will be received until June 14th for the construction of an addition to the eastern Departmental Building, Ottawa. Plans, etc., at above Department.

Parry Sound, Ont.

Geo. Rawlinson will receive tenders till June 10th for the construction of a brick veneered Sunday School room. (See advertisement in "Tenders and For Sale Department" of this issue.)

Regina, Sask.

Tenders will be received until June 6th for the following debentures: $16,000 20-year market building, $25,000 20-year agricultural industrial building grant, each at 4 1-2 per cent.

Sydney, N.S.

The civic authorities intend to agitate for the erection of an additional Provincial Normal School here.

Saskatoon, Sask.

The new Methodist Church at Nutana will be built by Marr, Son & Hoge, of Saskatoon, after school is finished. Estimated cost, [illegible]. Storey & Van Egmond, architects.

J. H. Noel is architect for the new opera house, 75 x 145 feet.

Tenders have been taken for erection of school building. David Webster, architect. Wm. P. Bate, secretary. Noted previously.

Strathroy, Ont.

A joint committee representing the town and the county conferred as to the advisability of erecting a hospital here. $12,000 is on hand, and $15,000 is being asked from the county. No decision was reached. A. K. Hodgins, chairman.

Smith's Falls, Ont.

G. T. Martin, architect, has been in Ottawa consulting the superintendent of the General Hospital regarding plans for a new public hospital to be built here.

Toronto, Ont.

Competitive designs for a residence for the Lieutenant-Governor will be received by J. O. Reaume, Minister of Public Works, until July 15th. Information, etc., on application to the Secretary of the above Department. (See advertisement in Tenders and For Sale Department, this issue.

The property, northeast corner of Ossington avenue and Davenport road, has been purchased by the I. O. O. F. and will be utilized as the Ontario Oddfellows' Home. Plans are being prepared for the erection of a handsome new home to cost in the neighborhood of $60,000.

Tenders for carpentry, painting, plastering and tinsmithing in connection with the midsummer repairs to the separate schools, addressed to J. Cadaret, chairman building committee, will be received until May 25th. Specifications at office of architect, Chas. J. Read.

The Board of Management of Knox College are asking for plans for their proposed new college buildings to be erected on St. George street. See advertisement in "Tenders and For Sale Department" of this issue.

Tenders are being called until May 30th by W. C. Wilkinson, secretary-treasurer, for enlargement of Huron Street School; alterations to Malvern Avenue High School, Duke Street and Crawford Street Schools, etc., and for erection of Elizabeth Street School and enlargements of Roden and York Street Schools. Plans, etc., at City Hall.

Virden, Man.

A by-law will be submitted asking $25,000 for a new public school.

Wainwright, Alta.

Tenders addressed to H. V. Fieldhouse, secretary-treasurer, will be received until May 31st for the erection of a solid brick 4 roomed school, according to plans, etc., prepared by Mr. E. D. Stimpson.

Winnipeg, Man.

Tenders addressed to E. D. Tuttle, architect, will be received until May 27th for the erection of a fresh air home at Gimli, Man., for the board of management of Methodist Church here.

Tenders addressed to J. H. G. Russell, architect, Sylvester-Willson Building, will be received until May 27th for the erection and completion of a brick and reinforced concrete building for the Convalescent Home.

Commissioner J. B. Mitchell prepared the plans for the two new collegiates mentioned in our last issue. Tenders will be called shortly.

The Salvation Army will have an Industrial Home built for the use of mechanics. The Rupert street citadel is to be enlarged and renovated. Work will be done by day labor.

The Winnipeg [illegible] will have a

Club house and kennels erected at Tuxedo Park. S. W. Abbott is secretary.

J. B. Morrison has the lowest tender in for the Riverview Church, and will probably be awarded the contract.

AWARDED.

Lethbridge, Alta.

The contract for erecting Y. M. C. A. building has been awarded to Smith Bros. & Nelson, of Lethbridge, for $47,980, not including heating and plumbing.

Port Dalhousie, Ont.

Mr. Peacock, Welland, has the contract for 2-room school here, $9,000, also one at Vineland, $4,000.

Quebec, Que.

For the construction of a Normal School the Provincial Government has awarded the contracts as follows: Emile Cote, 360 Richelieu street, Quebec, masonry; Jinchereau & Lamonde, carpentry, joiner work, roofing, painting and glazing.

Regina, Sask.

J. P. Merrick and J. H. McDonald secured the contracts for the new buildings to be erected at the fair grounds. Sharron & Trip, architects.

Southampton, Ont.

J. C. Eckford, town clerk, sends us the following: The contract for Town Hall was awarded on 19th inst. to the Chippawa Lumber Company of this town, the contract figures being $10,947. The other tenders received being only for various trades and parts of the work, were returned to the persons entitled thereto. The estimate of the architect was about $11,000.

Saskatoon, Sask.

G. N. Hughes got the contract for new civic coal and oil warehouse. The Saskatoon Construction & Engineering Company got contract for standpipe at $2,977.

St. Catharines, Ont.

The contracts for the various lines of work in connection with the Nurses' Home were awarded as follows:—Masonry, brickwork and plastering, Frank Hoare, $2,000; carpentering and moving building, J. W. Carle, $2,000; painting and decorating, Leach & Jones, $238.

Toronto, Ont.

Tenders were awarded for the erection of the new Oakwood High School. The following are the successful tenderers:—Masonry, H. Lucas & Son, $75,416; carpentering, M. Hutchinson, $24,935; reinforced concreting, A. Gardner & Company, $11,040; flooring, Sanitary Flooring Company, $1,240; roofing, A. B. Ormsby Company, $2,227; plastering, T. Blackburne & Son, $7,250; painting, James Taylor, $3,000; plumbing, Keith & Fitzsimons, $3,050; steel work, W. H. Salter, $4,800; heating and ventilating, Keith & Fitzsimons, $9,940; heat reguator, Johnson Temperature Regulating Company, $1,585; electric wiring, Fred. Armstrong, $97; total, $142,762.

The Provincial Government have awarded the contract for the building of the addition to the rear of Osgoode Hall to Mr. S. F. Whitham, Toronto and Brantford, the lowest tenderer. The contract comprises the whole work of construction and finishing with the exception of heating and plumbing. The contract price is $86,000. In all fourteen bids for the building were received.

Union, Ont.

The following tenders for erection of school in Section 8, Yarmouth, were received: Masonry: Jno. Leverton, Sparta, Ont., $1,331 (accepted); C. Smale, Sparta, Ont., $1,393; Frank Little, St. Thomas, $1,840. Carpenter work: Cameron & Buffy, St. Thomas, $1,125 (accepted); Shaffer & Elliott, St. Thomas, $1,366; John Walker, Spartar, Ont., $1,290. Painting and glazing: W. F. Midforth, St. Thomas, $120 (accepted); E. Dallyn, St. Thomas, $125; W. Morse, St. Thomas, $140. Heating and tinsmithing: Ingram & Davy, St. Thomas, $135 and $22; H. M. Ellison, Port Stanley, $160 and $22.85; G. T. Stewart, St. Thomas, $162 and $16. Slating: C. Riddals, St. Thomas, $265.35.

Residences

Carleton Place, Ont.

The following residences were destroyed by fire on the 18th inst: W. W. Wilkie, brick residence, $2,500; Finley McEwen, two houses, $8,000; John McDonald, loss $4,000; Peter McDonald, stables and sheds, loss $2,000; E. P. Wilkie, residence, loss $4,000; Wm. Comrie, residence, loss $3,500, some insurance.

Montreal, Que.

Mr. Z. Trudel, architect, has prepared plans and specifications for the erection of an apartment house on Park avenue.

Dalbe Viau, architect, is preparing plans for a residence at Lachine for Mr. Bournet.

Tenders will be received until May 27th for the erection of an apartment house at Mile End for Mr. J. A. Jarry. Dalbe Viau, architect.

Mr. L. R. MontBriant, architect, is erecting seven flats on St. Andre street by day work.

An apartment house is being erected by the contractors and proprietors, Messrs. O. Martineau & Fils, Limited, at the corner of Berri and Marie Anne streets, approximate cost $21,000.

Plans have been prepared for alterations to residence on Belleville avenue, Westmount, for Mr. G. F. Johnston. Ross & McFarlane, architects.

Ottawa, Ont.

Recent building permits are: Mrs. K. Arnoldi, Wilbrod street, solid brick, $8,000, J. A. Ewart, architect; Robert Taylor, brick veneer, Powell avenue, $4,500; V. V. Rogers, brick veneer dwelling, Regent street, $4,000; Aaron Drazin, solid brick shop and dwelling, Murray street, $6,500; Pierre Marchand, brick veneer iron clad double house, Stewart street, $5,000; J. McFarlane, brick veneer iron clad dwelling, Flora street, $6,000; Ralph Smith, dwelling, MacLaren street, $5,000; Nap Seguin, brick veneer dwellings, Osgoode street, four in row, $4,500; W. Shenkman, brick veneer dwellings, Clarence street, $4,500; Henry Villeneuve, double brick veneer dwelling, Arthur street, $3,000; James E. Wilson, solid brick dwelling, Wilbrod street, $3,500; K. Cohen, brick veneer row of three, Queen street west, $4,500; A. Larocque, solid brick dwelling, McLeod street, $3,000; James O'Connor, sr., brick veneer double dwelling, Laurier avenue east, $3,000.

Quebec, Que.

Permit was granted to J. Villieneuve & Fils, contractors (E. Jobin, proprietor), repairs to house on St. Joseph street, $4,000.

Toronto, Ont.

J. Henry and A. Hendrie intend erecting at 581 Jarvis street a 4 storey brick apartment house costing $38,000.

Victoria, B.C.

Tenders have closed for residence for Mr. Justice Galligher. Cost, $20,000.

Winnipeg, Man.

A permit was issued to G. F. Galt, apartment block, Wellington crescent, two and a half storeys, 78 x 92 feet. Contractor, W. Horner, architect; J. D. Atcheson. Cost, $50,000.

Winnipeg, Man.

J. Senecal, contractor, has commenced work on A. Petvin's house, $5,600.

Winnipeg, Man.

D. Boyce Sprague will have a $14,000 residence built on McMillan avenue, near Aynesley street.

K. B. Skagford will construct thirty houses in Norwood this summer, to cost over $65,000.

AWARDED.

Almonte, Ont.

The contract for the erection of a new Methodist stone manse has been awarded to Mr. A. C. Gilmour, of Perth, at about $3,000.

Montreal, Que.

Tenders have been awarded as follows for the erection of J. M. Wilson's house, Ontario avenue: Masonry and brick work, Mr. Hurdeau; carpentering, H. Demers. Estimated cost, $50,000. Messrs. Saxe & Archibald, architects.

Contracts for the erection of eight residences at Outremont, Que., for Mr. R. Ironside have been awarded as follows by Ross & Macfarlane: Masonry and brick work, James Young; carpentering, T. C. M. Bulmer; roofing, Geo. W. Reed & Company; plumbing and heating, T. Lessard & Sons; electric wiring, W. J. O'Leary & Company.

The contract for the masonry work, residence on Mountain avenue, Westmount, for C. C. Ballantyne, Esq., has been awarded to Sparrow & McNeil. E. & W. S. Maxwell, architects.

The general contract for the erection of the St. Matthew Apartments, St. Matthew street, for a syndicate of builders has been awarded to Mr. J. H. Hand, general contractor. Wright & Son, architect.

Business Buildings and Industrial Plants

Brantford, Ont.

Mr. John Peachey has made application for a permit for a block of stores, $8,700.

Brandon, Man.

Chas. Hall has commenced erection of new warehouse and office building for Beattie & Sons. Solid brick. Architect Shillinglaw.

Plans are ready for stores and apartment block for Ingram, Matheson & Inglis, 3 storeys. Pressed brick and stone will be used. W. A. Elliott, architect.

A permit has been issued for 3 storey brick block, 45 x 60 feet, $20,000, for Mr. F. Nation. Architect Shillinglaw.

Calgary, Alta.

John Mosley has purchased a site for a new Dominion Hotel.

Cardston, Alta.

The Cardston Implement Company is to erect a 2 storey brick building. J. C. Cahoon and A. M. Heppler will also build.

Carleton Place, Ont.

The hardware store of H. Singleton was destroyed by fire on the 18th inst. Estimated loss, $10,000.

Elmira, Ont.

Besides the large new felt factory which will cost in the neighborhood of $40,000, an extension of one other factory is likely to be made.

Elbow, Sask.

Tenders were called until May 31st for erection of hotel here for E. Bowers. J. J. P. Bowler, architect, Brandon, Man.

Georgetown, Ont.

The Sykes Woollen Mills were destroyed by fire on the 18th inst. Loss, about $30,000.

Hamilton, Ont.

The Oliver Chilled Plow Works, South Bend, Ind., will locate its Canadian branch here. Estimated expenditure, $1,500,000. Following are some of the buildings to be erected at once: Six storey warehouse, 100 x 300 feet long; paint shop, three storeys high, 70 x 250 feet; assembly buildings, three storeys, 100 x 400 feet long. All buildings will be designed to be constructed of a combination of structural steel frame, and will have reinforced concrete floors and roofs, with red pressed brick exterior walls, with terra cotta trimmings. B. H. Prack, consulting engineer; W. A. McInerny, secretary.

Iroquois, Ont.

C. E. Keeler's shop, etc., were destroyed by fire on the 19th inst. Totol estimated loss, $3,500.

Kingston, Ont.

Board of Trade representatives had an interview with Manager McNulty, of the Wilbur Iron Mines, regarding the establishment of a smelter here. Proposed expenditure, $250,000.

Kenilworth, Ont.

O'Neil's planing mill, shingle mill, etc., were destroyed by an explosion on the 16th inst. Total estimated loss, $20,000.

London, Ont.

The London Concrete Machinery Company have acquired property in East London and work will be commenced at once on several buildings. J. C. Doidge is one of the firm.

Lethbridge, Alta.

Wm. Cousins will build a business block and hall here.

Melfort, Sask.

Wm. Fingland, architect, Winnipeg, has plans ready for a Bank of Hamilton building.

Medicine Hat, Alta.

It is stated that owing to the ratepayers at Portage la Prairie, Man., not giving the desired privileges, the Stephens Brick Company will build here.

Macleod, Alta.

The Macleod Quarry & Contracting Company are building a soap factory and three other residences and stores.

Montreal, Que.

The Kingsbury Footwear Company, Maisonneuve, have secured a site on William David street, taking in the block extending from Ernest to Girard streets, on which the company will erect a factory double the proportion of their present plant.

The property at the northeast corner St. Denis and Ontario streets, containing 69,000 square feet, has been acquired by Mr. J. B. Baillargeon, who will erect a three storey garage and storehouse 150 feet by 150 feet.

Mr. A. F. Dunlop is preparing plans for an addition to the Dougall Varnish Company's plant.

It is reported that the United Shoe Machinery Company will erect their additional factories at Maisonneuve rather than at Back River.

It is stated that a syndicate of English capitalists have offered one million dollars for the extensive sight of Christ Church Cathedral, facing St. Catherine street, between Union avenue and University street.

Plans for the Yorkshire Building have been curtailed and no awards will be made in this connection until next week.

Tenders are being asked for building the St. Lawrence Flour Mills Company's new mill on the Lachine canal. Mr. George Kent will take charge of the new construction. Noted in issue of May 11th.

Plans have been prepared for a new store building to be erected on St. Catharine street for Mr. John Allan. Messrs. Ross & Macfarlane, architects.

New Liskeard, Ont.

The council has accepted Mr. Matthew's proposition to erect a grist mill here. A by-law will be submitted to the ratepayers shortly.

Ottawa, Ont.

C. P. Meredith has plans for the new building to replace Crown Hotel, corner Sparks and Bank streets. Tenders will be called very soon.

A construction permit has been issued for the James Hope Building, to be erected on Sparks street, showing the proposed cost to be $90,000. W. E. Noffke is the architect.

Those who suffered loss by fire on the 17th inst. were as follows: G. McAllister, frame hotel; E. H. Hellard, store, etc. Total loss, $10,000.

Prince Rupert, B.C.

The Prince Rupert Brewing & Malting Company, with capitalization of $100,000, will at once erect a modern brewing plant.

Port Arthur, Ont.

Work is expected to be re-commenced on the new building for the Daily News. The present plan shows it to be two storeys in height, of colonial design, with massive columns from the street line to the roof cornice. There has been some talk of the building being carried up three storeys.

Quebec, Que.

It is stated that Champlain Market will be the site of the terminals for the National Transcontinental, and that the workshops may be located here. The waterfront will be considerably improved, providing wharves, elevators, etc. The customs house will likely be rebuilt on the same site.

Regina, Sask.

J. A. Goth, of the Regina Celastone Company, says his company will erect a $20,000 building this year.

F. M. Crapper has plans for a store building. White brick is to be used.

Jas. Balfour is to build later on a large store building. Dr. A. Gregor Smith intends to build at once a brick block, 3 storeys.

Plans are being made for a big block to be erected here for the Dominion Trust Company of Vancouver.

St. Johns, Nfld.

Labrador timber lands (about 13,580 square miles) have been transferred to a syndicate of American capitalists. It is stated that pulp mills will be erected at various points to operate the timber lands extending from Byron's Bay, on the north side of Hamilton Inlet to Port Manners. Capitalization of company, $25,000,000.

Sarnia, Ont.

Mr. J. McFee's livery barn and Mr. J. Ellison's hotel stables were destroyed by fire on the 21st inst. Total estimated loss, $10,000.

Saskatoon, Sask.

A new hotel, to cost $150,000, is to be erected here at once by Charles Underhill, late manager of the Flanagan House.

The plans for renovation and alterations to the Western Hotel are being made by N. Thompson, architect.

Drs. H. & P. Stewart will have a 3 storey block erected to cost $20,000.

J. H. Ashdown, of Winnipeg, has bought a building site (104 x 140) on which he will erect a wholesale hardware store shortly.

Norman Thompson, architect, is preparing plans for an extensive addition to Currie Bros.' block.

St. Boniface, Man.

It is learned that the Stock Yards Commission has recommended the granting of a charter to the St. Boniface Union Stock Yards Company, in which the C. P. R., the C. N. R. and G. T. P. are interested. If agreement is ratified, work will commence at once.

Vancouver, B.C.

The plans for east side of Beatty street include the erection of a $20,000 block by Mr. J. B. Campbell.

The Western Club have a permit for club house, $53,500.

Victoria, B.C.

A permit has been issued for addition to Empress Hotel, 68 rooms, $125,000.

A deal involving the expenditure of over $1,500,000 and the transfer of some 54,000 acres of timber land, the construction of 23 miles of railway and the erection of a large export saw mill on the east coast of Vancouver Island, it is stated, has been concluded. The parties interested are the E. & N. Railway Company and the American Finance Company, of New York.

Red Cliffe, Alta.

The J. M. Danelz Mercantile Company, Swift Falls, Minn., are to build a flour mill here. Cost, $30,000.

Weyburn, Sask.

Tenders were taken by Storey & Van Egmond, architects, Regina, for erection of warehouse for Cameron & Heap, Limited.

Welland, Ont.

H. S. Peters Company, of Dover, N.J., will establish a Canadian branch here for the manufacture of clothing. The factory will be 38 x 98, brick, three storeys.

The New-Way Motor Company, of Lansing, Mich., will establish a Canadian branch factory here in the near future. Directors, W. H. Newbrough, C. D. Woodbury, and L. M. Gleason, all of Lansing.

Wakefield, Que.

The following buildings were destroyed by fire on the 17th inst.: McLaren woollen mills, McLaren grist mills, and four residences, all owned by the McLarens, of Buckingham.

Wingham, Ont.

A by-law granting C. Lloyd & Son certain privileges was carried. The firm will at once commence the erection of the new building. Cost, about $15,000.

Winnipeg, Man.

Stevens' cooperage works in Elmwood were destroyed by fire yesterday afternoon. Loss, about $10,000. Owner of property, E. L. Drewry.

The Sterling Bank will commence erection of their bank at the corner of Portage and Smith streets, as soon as plans are ready.

Architect Northwood has prepared plans for the Dominion Bank branch.

The warehouse of McFarlane, Son & Hodgson, Limited, was damaged by fire on the 20th inst. to the extent of about $35,000.

(Continued on page 32)

Tenders and For Sale Department

Town of Huntsville

The Town of Huntsville offers for sale 20 [illegible] Debentures of $962.91 each, [illegible] for 20 years at 5 per cent., [illegible] tenders received up to MAY [illegible]

T. M. CULLON,
Clerk, Huntsville.

Tenders Wanted

Sealed, bulk and separate tenders, marked "Tender," addressed to the Secretary of the Board of Education, Arnprior, will be received up to 7 o'clock p.m., MONDAY, MAY 30TH. INST., for the erection of an addition to and alterations in the High School Building, Arnprior.

Plans and specifications of the proposed work may be seen at the office of Mr. C. A. R. Dulmage, Chairman of the Contingent Committee, between the hours of 9 a.m. and 5 p.m.

Each tender must be accompanied by a cheque for 5 per cent. of the amount of the tender.

The lowest or any tender not necessarily accepted.

M. D. GRAHAM,
Secretary, Board of Education,
Arnprior, Ont.

1

City of Regina

Sidewalk Construction

Sealed tenders addressed to the undersigned City Clerk and endorsed on envelopes 'Tenders for Sidewalk Construction,'' will be received up to 12 o'clock noon, MONDAY, MAY 30TH, 1910, for approximately 50,000 square feet of concrete sidewalk.

Particulars may be had upon application to the City Engineer.

A marked cheque for $500.00 must accompany each tender. The cheques of unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

L. A. THORNTON, City Engineer.
A. E. CHIVERS, City Clerk.

21

City of Fort William, Ontario

Reinforced Concrete Bridge

Tenders will be received by the City Clerk up to 5 o'clock p.m. on FRIDAY, THE 3RD DAY OF JUNE, 1910, addressed to the Chairman of Works Committee, for the construction of a reinforced concrete arched bridge of 50-foot span, with pile foundations, to be used for double-track street railway, vehicular and pedestrian traffic, crossing the Neebing River on Simpson Street.

All tenders must be on the special form of tender, accompanied by an accepted cheque for a sum equal to 10 per cent. of the amount of the tender, with the envelope sealed and endorsed "Bridge Tender."

Plans, specifications and general conditions may be seen and form of tender obtained at the City Engineer's office.

The lowest or any tender not necessarily accepted.

H. S. HANCOCK, Jr.
City Engineer.

21

To Architects

Competition Plans

The Board of Management of Knox College, Toronto are desirous of obtaining plans for their proposed new College Buildings to be erected on St. George Street to the westward of the Lawn of the University of Toronto.

Conditions of Competition, with all information, can be had on application to the Rev, John Sommerville, Confederation Life Building, Toronto.

Plans must be sent by the FIRST OF NOVEMBER NEXT. 23

Tenders For

Crushing Stone

Sealed tenders, addressed to the undersigned and endorsed "Tender for Stone" will be received up to 12 o'clock noon, on MONDAY, MAY 30TH, 1910, for crushing and delivering on the road about 4,000 cubic yards of stone, the contractor to provide all necessary machinery, etc. The stone for crushing may be obtained along the West Branch of the Humber River on lot No. 6 in the 8th concession, and lots Nos. 7 and 8 in the 9th concession of the Township of Toronto Gore. The road to be improved is the 9th Line (Gore Road), in said township, commencing at the county line between Peel and York, and extending northerly. The tenders will be opened at the office of the Clerk of the County of Peel, Brampton, at 2 p.m. on the above date.

For further particulars apply to the undersigned.

The lowest or any tender not necessarily accepted.

J. G. JULIAN
Reeve of Toronto Gore Tp,
Castlemore P.O.

21

Tenders for Paving

The City of Saint John

Invites Tenders for

Paving, etc., in Main, Pond, Smythe, Nelson and St. John streets, according to plans and specifications to be seen and forms of tender obtained at the office of the City Engineer, Room No. 5, City Hall, duplicates of which are on file in the office of the "Contract Record," 504 Confederation Life Building, Toronto.

A cash deposit must accompany each bid, the amount being as stated in each specification.

The city does not bind itself to accept the lowest or any tender.

All tenders must be addressed to the Common Clerk, Room No. 3, City Hall, who will receive bids until noon of TUESDAY, THE 31ST DAY OF MAY, A.D. 1910.

ADAM MACINTYRE, Comptroller.
WM. MURDOCH, City Engineer.

St. John, N.B., May 7th, 1910. 21

Tenders for Boilers

Sealed tenders addressed to the undersigned and marked "Tender for Boilers," will be received until noon on SATURDAY, JUNE 11TH, 1910, for two Return Tubular Boilers, 72 inch by 18 feet, to maintain a working pressure of 150 pounds per square inch.

Specification may be obtained from the City Engineer on application.

C. O. DAVIDSON,
City Clerk.

1910. 22

Dated at Prince Albert, Sask., May 17th,

City of Regina

Province of Saskatchewan

Sewage Disposal Works

Sealed tenders will be received until noon, MONDAY, JUNE 6TH, 1910, for the construction of Sewage Disposal Works for the City of Regina. Tenders must be accompanied by an accepted bank cheque or other satisfactory deposit for the amount of $5,000.

The deposits of unsuccessful tenderers will be returned as soon as the contract is signed.

The right to reject any or all tenders or to waive any irregularities therein is to be at the discretion of the City authorities.

Plans, specifications, forms of tender and all information may be obtained on application to the City Engineer's office, Regina.

A. J. McPHERSON, C.E., Consulting Engineer.
A. E. CHIVERS, City Clerk.

Regina, Sask., May 12th, 1910, 22

Temiskaming and Northern Ontario Railway Commission

Sealed tenders addressed to the undersigned, and endorsed on envelope "Tender for Nipissing Junction Spur," will be received up to 12 o'clock, noon, JUNE 8TH, for Clearing, Grading, Embankment Protection, Driving of Piles, Building of Culverts and Laying of Tile, that may be required in connection with the construction of a branch line for the T. & N. O. Railway, between North Bay and Nipissing Junction.

Plans and specifications may be seen at the office of the Chief Engineer, North Bay, and the Secretary-Treasurer, 25 Toronto Street, Toronto.

Certified cheque on a chartered bank of Canada, payable to the order of the Secretary-Treasurer of the Commission, for 10 per cent. of the amount of the tender, must accompany each tender.

Lowest or any tender not necessarily accepted.

A. J. McGEE, Secretary-Treasurer,
25 Toronto Street, Toronto, Ont.

Dated at Toronto, May 18th, 1910.

Papers inserting this advertisement without authority will not be paid for same. 22

To Builders and Contractors

Sealed, separate or whole, tenders will be received by the undersigned up to six o'clock p.m. of SATURDAY, JUNE 4TH, 1910, for all the work and material (with hot-water heating) required in the erection of a Public Library Building at Orillia, Ont.

Plans, specifications and particulars may be had at the office of architect, on and after Monday, 23rd of May.

The lowest or any tender not necessarily accepted.

W. H. CROKER,
Architect.
Orillia, May 18th, 1910. 22

Tenders

Sealed tenders for brick veneered Sunday School room, consisting of two storeys and basement, for Methodist Church, Parry Sound, will be received by the undersigned until noon on JUNE 10TH, 1910.

Plans and specifications may be seen at my store, James Street, or at the office of J. S. Russell, Stratford.

The lowest or any tender not necessarily accepted.

GEO. ROWLISON,
Recording Steward.
Parry Sound, May 18th, 1910. 22

Bridge Tenders

Tenders will be received up to JUNE 3RD for the following work in the northern part of the County of Wellington:

1. Fifty-foot steel bridge and abutments.
2. Concrete abutments for two bridges.
3. Concrete box culvert, 10-foot opening.

Plans, etc., may be seen with Henry Barkwell, Esq., Goldstone, and full information from the engineers.

BOWMAN & CONNOR,
21 36 Toronto Street, Toronto.

City of Fort William

Sewers

Tenders will be received by the City Clerk up to 5 o'clock, p.m., on FRIDAY, THE 3RD DAY OF JUNE, 1910, addressed to the Chairman of the Works Committee, for the construction of the following sewers:

Contract 10-11.—A reinforced concrete sewer, 5 feet 9 inches internal diameter, on Francis Street (Ford to Edward), 1,380 feet, more or less; a 4-foot 6-inch reinforced concrete sewer on Edward Street (Francis to Amelia), 400 feet, more or less.

Contract 10-12.—A tile sewer on Amelia Street (Ford to Brown).

Contract 10-13.—A concrete sewer on May Street (Dease to Myles); a concrete sewer on Dease Street (Brodie to May); a concrete sewer on Brodie Street (Dease to Leith).

Contract 10-14.—A concrete sewer on McKenzie Street, (Simpson to Rowland); a concrete sewer on Rowand (Simpson to Pacific).

All tenders must be on the special form of tender accompanied by an accepted cheque for a sum equal to ten per cent of the amount of the tender, with the envelope sealed and endorsed "Sewer Tender—Contract No...."

Tenders of each contract must be in separate envelopes and accompanied by a separate cheque.

Plans, specifications and general conditions may be seen and forms of tender obtained at the City Engineer's office.

The lowest or any tender not necessarily accepted.

H. S. HANCOCK, Jr.,
City Engineer.

Dated at Fort William, May [illegible], 1910. 21

To Plumbing and Heating Contractors

Sealed bids addressed to the undersigned will be received up to noon of WEDNESDAY, JUNE 1ST, 1910, for the plumbing and steam heating, exclusive of tile drains and gas fitting, required in the alterations and addition to the Royal Victoria Hospital, Barrie, Ont.

The lowest or any bid not necessarily accepted.

Plans and specifications may be seen at the office of the architect.

F. S. Baker, architect,
21 Traders Bank Bldg., Toronto.

Tenders

Sealed tenders, addresesd to either of the undersigned, will be received until noon on WEDNESDAY, JUNE 8TH, 1910, for the construction of a 50-foot reinforced concrete arch bridge over Kettle Creek, in the Village of Belmont, for the Counties of Elgin and Middlesex. Plans and specifications may be seen at the offices of the undersigned. A marked cheque for the sum of $200,000 payable to either the Treasurer of Elgin or Middlesex, must accompany each tender as a guarantee of good faith. The committee reserves the right to reject any or all tenders.

JAS. A. BELL, County Engineer,
St. Thomas, Ont.

CHAS. TALBOT, County Commissioner,
London, Ont.

St. Thomas, May 21st, 1910. 22

City of Regina

Province of Saskatchewan

Sewers

Sealed tenders will be received up to noon, MONDAY, MAY 30TH, 1910, addressed to the undersigned, for each of the following contracts for the construction of Storm Water and Sanitary Trunk Sewers and Disposal Works:—

Contract A. The construction of sewers as follows:

10761 feet, 30-inch.
3248 feet, 48-inch.
2369 feet, 5-foot 6 inches.
8392 feet, 6-foot.

Contract B. The supply of 11,500 barrels of Portland Cement for the above sewers.

Contract C. The supply of reinforcement for the sewers.

Contract D. The supply of sewer pipe for branches from the sewers.

Contract E. The supply of manhole covers and other special castings.

Contract F. The supply of 700 cords of Field Boulders for the Percolating Filters.

Contract G. The supply of 3,600 barrels of Portland Cement for the Disposal Works.

Tenders for A. and F. must be accompanied by an accepted bank cheque for $10,000 and $2,500 respectively or other satisfactory deposits for the above amounts.

The deposits of unsuccessful tenderers will be returned as soon as the contracts are signed.

The right to reject any or all tenders or to waive irregularities therein is to be at the discretion of the City authorities.

Plans, specifications, forms of tender and all information may be obtained on application to the City Engineer's office, Regina, Saskatchewan.

A. J. McPHERSON, C.E., Consulting Engineer.
A. E. CHIVERS, City Clerk.

Regina, Sask., May 7th, 1910. 21

Board of Education

TORONTO

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board will be received for

Enlargement of Huron Street School.
Alterations to Malvern Avenue High School, Duke Street and Crawford Street Schools.
Hardware.
Garden Hose.
Lawn Mowers.
Floor Oil and Turpentine.

until FRIDAY NOON, MAY 27TH, 1910, and for

Erection of New School Building, Elizabeth Street;
Enlargement of Roden School and York Street School,

until MONDAY NOON, MAY 30TH, 1910. Plans and specifications may be seen and all information obtained at the office of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in said specifications and forms of tender. The lowest or any tender not necessarily accepted.

W. H. SMITH, Chairman of Committee.
W. C. WILKINSON, Secretary-treasurer.
21

Notice to Architects

Competitive designs for a Residence for the Lieutenant-Governor of the Province of Ontario, proposed to be erected on Bloor Street, in the City of Toronto, will be received by the undersigned at the Department of Public Works, Parliament Buildings, Queen's Park, Toronto, up to noon on the 15TH DAY OF JULY NEXT.

Information and particulars as to the extent and character of the said designs can be obtained upon application to the office of the Secretary of Public Works.

Subject to such terms, conditions, etc., the following premiums are offered:

For the design most approved......	$1,000.00
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J. O. REAUME,
Minister of Public Works.

Department of Public Works, Ontario.
Toronto, May 12th, 1910. 23

Positions Wanted

[illegible]

WANTED POSITION AS SUPERINTENDENT, to take charge of concrete or railway construction work. I am thoroughly experienced in this line of work. Address, Box 978, "Contract Record," Toronto, Ont.

CIVIL ENGINEER [illegible] large Water Power Development [illegible] ahead of time, is open for engagement.—Box [illegible], CONTRACT RECORD, TORONTO.

Miscellaneous

Advertisements under this heading two cents a word an insertion.

FOR SALE CHEAP—One hundred thousand feet well seasoned white pine timber, part old [illegible] Mill; six thousand feet cedar, eleven thousand feet hemlock, four hundred feet white oak; all in various sizes, six to sixteen inches, and lengths, six to thirty feet. For particulars [illegible] J. W. ARMSTRONG, Trenton, Ont. 21

Positions Vacant

Advertisements under this heading two cents a word an insertion.

WANTED—TRAVELLING SALESMAN to represent firm manufacturing bank, office and store fittings. Must be competent to make sketches, etc. Man having experience in architect's office preferred. Apply, Box 974 "Contract Record," Toronto TF

Business Buildings and Industrial Plants

(Continued from page 29)

James McClement has been awarded the contract for the brick work of the block being built by J. B. Curran on Rosser avenue.

AWARDED.

Montreal, Que.

Contractors for erection of a canned meat factory for Mr. J. D. Villeneuve, to be erected on Papineau avenue, have been awarded as follows: Masonry and brick work, J. Major; carpentering, B. Brouiellette. L. R. MontBrient, architect.

General contract for the alterations and additions to the factory on Havre street, for the Montreal Light, Heat & Power Company has been awarded to Mr. C. E. Deakin, general contractor.

The contract for the masonry and brick work in a five storey factory on Partenais street for the Dominion Oilcloth Company, Limited, has been awarded to Eusebe Meloche, 304 Eighth avenue, Rosemount. This building will be of fireproof construction and will cost approximately $80,000. Messrs. Hutchison, Wood & Miller, architects.

Norwood, Man.

Messrs. Saul & Irish have the contract for the erection of the Bank of Hamilton branch here at $30,000. W. Fingland, architect, Winnipeg.

Roland, Man.

W. H. Rosewarne, Winnipeg, has the contract for the erection of Bank of Hamilton branch here. Architect, W. Fingland.

Power Plants, Electricity and Telephones

Barrie, Ont.

The Monarch Railway is seeking a 25 year franchise to run its lines along certain streets here, connecting with Toronto; construction to commence within 2 years.

Calgary, Alta.

The $70,000 electric light plan extension by-law was carried by the ratepayers.

Fort William, Ont.

Tenders are being called by street railway construction department until June 2nd for the supply of the materials needed in the construction of railroad. Specifications at City Engineer's office. A. L. Farquahrson, construction superintendent.

Garvin, Sask.

Tenders will be received until July 15th for the construction of a telephone line. W. Geier Switzer, secretary-treasurer, Arm River Rural Telephone Company.

Hull, Que.

Fire destroyed residences here to the value of about $10,000.

Kingston, Ont.

The Northumberland Durham Power Company has made a proposition of cheap power to the Board of Trade here.

New Westminster, B.C.

Plans of the new B. C. E. R. depot have been prepared and tenders will be called shortly. Cost, $80,000.

Ottawa, Ont.

The Railway Commission is sending out an order requiring all street railways under its jurisdiction to equip their larger cars with air brakes.

Portage la Prairie, Man.

The proposition of C. Chamberlain, of the Great Fall Power Company to furnish power to the city for a term of 30 years, etc., was accepted.

Quebec, Que.

Tenders will shortly be invited for the construction of a concrete dam and power house at St. Alban. J. F. Guay, consulting engineer, Morin Building, Quebec.

Saskatoon, Sask.

This city has signed a contract with the Saskatoon Power Company for the harnessing of the South Saskatchewan river, 14 miles below the city.

Toronto, Ont.

Messrs. Jacobs, Davies & Forgie, engineers, of New York, will probably be chosen as consulting engineers in connection with the tube railway question.

Victoria, B.C.

Tenders addressed to the Minister of Public Works will be received until June 6th for the construction of a transmission line for the carrying of electricity to the Hospital for the Insane at Coquitlam. Plans, etc., at government offices. F. C. Gamble, Public Works Engineer.

Yorkton, Sask.

City Secretary-Treasurer is authority for the statement that the question of constructing municipal electric light plant has been discussed, but nothing further has been done.

AWARDED.

Fort William, Ont.

The Carter-Jones Electric Company, of this city, will commence work shortly on a telephone system in Oliver township. There will be 100 miles of wire strung and 800 poles placed in position.

Montreal, Que.

The contract for the erection of a country house at Pincourt, Que., for Mr. J. W. Fontaine has been awarded to Mr. J. St. Maurice. Messrs. MacDuff & Lemieux, architects.

The contract for the bungalow to be erected at Quinchien, Que., for Mr. L. A. Jacques has been awarded to Mr. J. St. Maurice. Messrs. MacDuff & Lemieux, architects.

The contract for the country house at St. Jeanne, Ile Perrot, Que., for Mr. L. Lemieux, has been awarded to Mr. J. St. Maurice. Messrs. MacDuff & Lemieux, architects.

Prince Rupert, B.C.

James Milne, consulting engineer, of Vancouver, has let contracts for steam and electrical apparatus required by this city. The awards were as follows: Boilers, pumps and piping, Goldie & McCulloch Company, Galt, Ont.; surface condenser, circulating and air pumps, John Inglis Company, Toronto; exciter and switchboard, Canadian Westinghouse Company, Hamilton, Ont.; cross compound engines, Robb Engineering Company, Amherst, N. S.; alternators and arc apparatus, Canadian General Electric Company, Toronto. The total cost of the plant will reach about $60,000.

Vancouver, B.C.

M. P. Cotton received the contract from the B. C. E. R. for clearing and grading the new line from Burnaby to Vancouver, a distance of 7 1-2 miles. Expenditure, over $150,000.

Vancouver, B.C.

The tenders for lighting system on streets here were recently as follows: For the electric work, concrete work and erection of standards complete, ready for service: Electrical Construction Company, Limited, $53,317; Frank Darling & Company, Limited, $55,350; the Hinton Electric Company, Limited, $46,908. For the concrete work and erection of the standards alone: M. P. Cotton & Company, Limited, laying of ducts in concrete sidewalks, 40c per lineal foot; on boulevards, 30c per lineal foot; $5 per junction box and $10 per foundation and setting of standards. For the lamp standards: The Canada Foundry Company, Limited, $74 per standard; Frank Darling & Company, $56.50; Letson & Burpee, $54.75; Earle & Company, $48.50; B. C. Supply Company, $56; Ross & Howard, $60; Walter McFarlane & Company, Glasgow, $61.75; Flour City Ornamental Iron Works, Minneapolis, $78. As the Hinton Electric Company's tender covered the entire electrical and concrete work, including erection of the standards, and the lowest by $6,409, the contract for all the work was awarded to that firm. Messrs. Earle & Company's price for the lamp standards was $6.25 per standard lower than the second lowest bid, and it was decided to have them supply the standards.

Welland, Ont.

Contractors Patton and Peacock have secured the contracts for the masonry and carpenter work respectively on a $20,000 brick mansion near Jordan.

Miscellaneous

Port Colborne, Ont.

Tenders are being called until June 3rd by the Department of Railways and Canals, Ottawa, for Port Colborne entrance improvement. Plans, etc., at Department of Railways and Canals, Ottawa, and at the office of the superintending engineer, St. Catharines. L. K. Jones, secretary.

AWARDED.

Calgary, Alta.

The contract for an extension of the C. P. R. irrigation system into the eastern section of the irrigation block has been awarded to James McDonnell & Company, of Vancouver, with whom are associated Winter, Boomer & Hughes and Grant, Smith & Company, all of Spokane, Wash. The contract is for $5,230,000, and includes canals calling for excavation of twenty-eight million cubic yards of earth. The contract price is about a quarter of a million under the estimate of the C. P. R., and carries a time limit of five years.

Medicine Hat, Alta.

A. K. Grimmer, M.Sc., City Engineer, writes that the contract for steam road roller was awarded to J. I. Case Company, for $3,050; that for concrete mixers to the Canada Foundry Company at $1,325. Mussens' tender on distributing wagons was accepted at $257 each.

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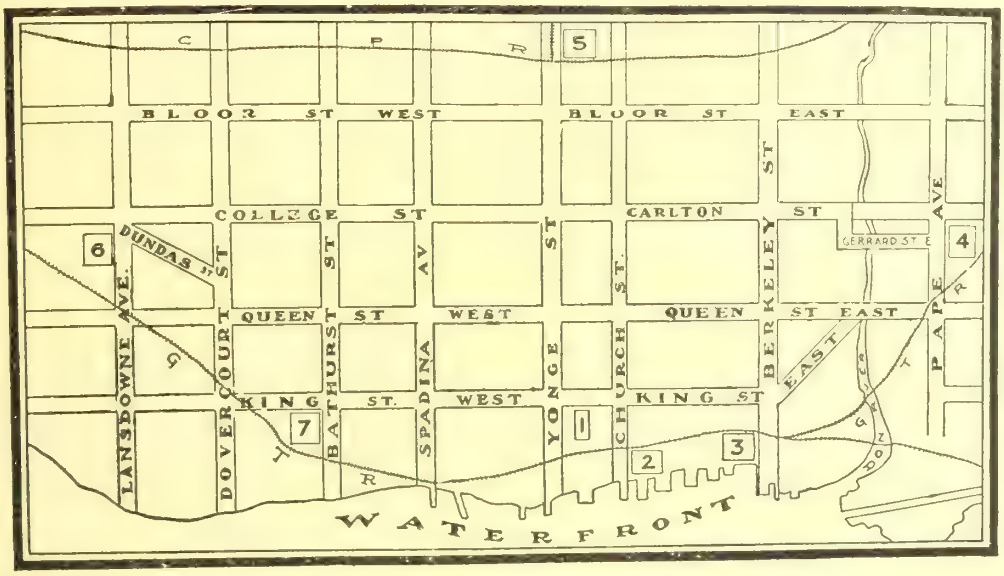

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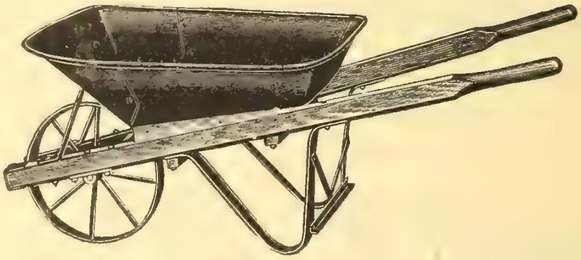

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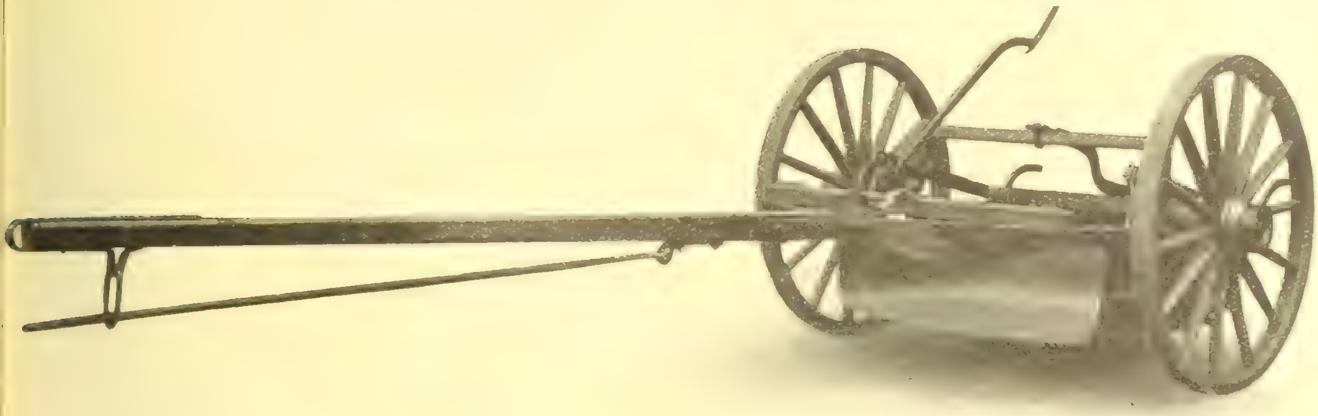

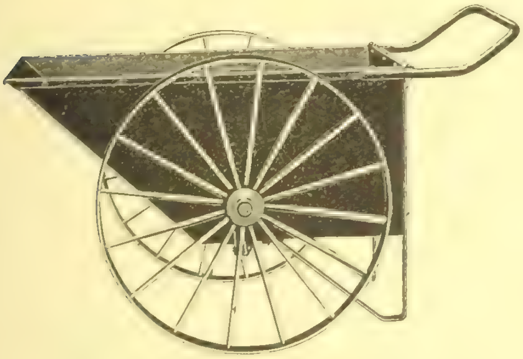

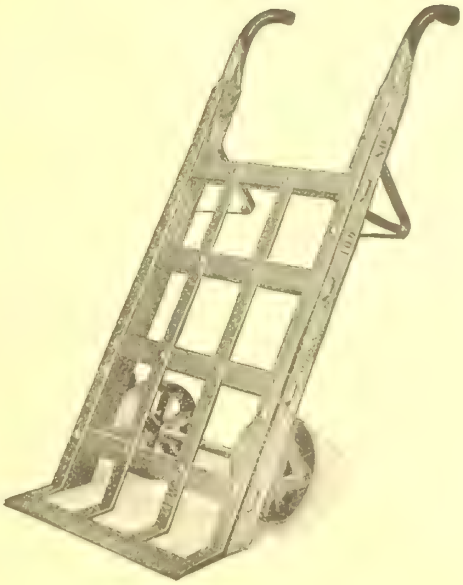

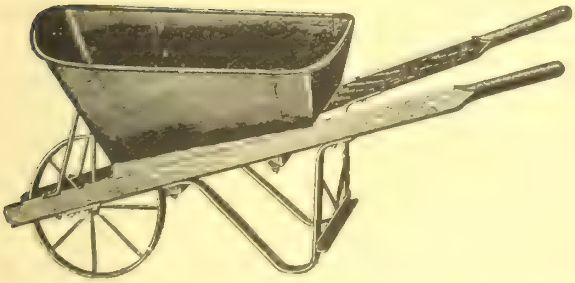

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Brick and Other Contructive Material

Perhaps no problem ever provided the building community with more food for reflection than that of a judicious and satisfactory selection of constructive material. In view of the successes of concrete in every department during recent years, the subject is of particular interest at the present time. We do not hold a brief for brick, but we wonder whether the various charges that are laid against it could really be sustained if a reliable investigation were to be made.

History indicates that considerations of economy and availability first led to the making of brick in any considerable quantity, and that the early Romans, who were both economical and practical, developed their manufacture and that of terra cotta and utilized the material in the remarkable structures of that day. A material possessing qualities of pliability and durability and offering in addition the many other advantages of burnt clay, which rendered it susceptible of almost universal adaptation, once thoroughly understood, inevitably became the building material of the epoch, and its favor has scarcely diminished in modern times. Indeed it appears doubtful if there is any material which constitutes a larger factor in the building world of to-day. Other materials have been proposed from time to time and have, in fact, been adopted under certain conditions and for certain uses, but this fact, in the opinion of many, has served rather to stimulate and increase the appreciation of buildings whose facades are constructed of brick. That a well designed building built of brick selected with discriminating taste, and laid with the skill of an artisan possesses a charm beyond that of one constructed of almost any other material will surely be conceded. Of course, there are certain monumental buildings for which no material appears suitable except granite, marble or limestone—buildings which seem to demand a more noble and precious material than burnt clay for their proper execution, but this is probably due to the fact that their prototypes were designed for execution in such material. It would be equally inappropriate or impossible to construct some of the cathedrals of the middle ages of stone. A design in the fullest sense is more than a portrayal of forms. It includes a selection of materials, either consciously or unconsciously. This fact has not always been sufficiently recognized, and it is one of the most certain indications that architecture is receiving intelligent study, to observe the increased attention given to the selection of materials of construction during recent years.

Day Labor Work

Of the various claims that have been urged in its favor by the exponents of the day labor system of doing construction work, there are two which are just now popular. The first is the difficulty of drawing contracts to cover unknown conditions, and the second is the flexibility of the day labor system in allowing changes in plans, etc., says a writer in "Engineering-Contracting." Just to how much does either of these claims amount? If we may believe the advocates of the day labor system, they amount to enough to warrant day labor construction in very many instances. Neglecting all other phases of the case between the day labor and the contract systems of doing construction work, let us consider these two.

Stated briefly, the propositions we have to consider are: First, it is exceedingly difficult to draw contracts which will cover the multitude of unforeseen obstacles and contingencies to be met on certain classes of work. Second, plans can be modified or even radically changed after work is begun if the work is being done by day labor, while a similar procedure under contract work is, customarily, expensive and difficult. If this is a fair presentation then these two statements are tantamount to saying either that engineers are not capable of determining and predicting the conditions of work with any degree of confidence, or that engineering and legal acumen are insufficient to devise contract requirements for meeting undetermined conditions or that the engineer has not given the work careful and competent investigation and must supply the deficiency by leaving the way open for changes in plan to meet the conditions as they become known, or that contractors as a class are not open to fair business propositions. To which of these alternatives do engineers wish to subscribe?

How frequently do we meet with indeterminate conditions in planning construction work? Undetermined conditions are common enough and occasionally without doubt circumstances arise which involve so much uncertainty as to conditions under which work is to be prosecuted as to make it difficult to prepare satisfactory specifications to cover them; but such occasions are rare. Take, for example, underground work, which as a class is commonly admitted to be particularly subject to uncertainties; how often has it been found impracticable to cover it satisfactorily by contracts and specifications. The Boston and New York subways, the Pennsylvania and other railway tunnels under the Hudson and East rivers, the water supply tunnels of the Metropolitan Water and Sewerage Board at Boston and the Catskill aqueduct work at New York, were all constructed by contract and no unsurmountable difficulty was found in drawing satisfactory agreements and specifications. Other examples can be cited by scores of work quite as complex if one needs them. The truth is that we do not. There is not the slightest impossibility or even very serious difficulty in eliminating uncertainties to such an extent as pretically any piece of construction work that the contract forms in common use will provide amply for all contingencies. In the rare case where they will not, any reputable contractor will meet the engineer half-way in an adjustment of differences. It is a popular notion, we know, to believe differently, but it is a callow notion.

Turning now to the argument of the flexibility of the day labor system in allowing for changes in plans, etc., we must credit it with some force. Conditions sometimes develop which make it desirable or even necessary materially to modify or radically change the plans upon which a contract has been based. Such changes are always unfortunate and usually expensive in contract work, the contractor being in the more advantageous position in the negotiations for the price to be paid for the work under the revised plan. If, on the other hand the work is done by day labor, changes of any kind may be made, at any time, often without unduly increasing the cost of the work and sometimes even materially reducing it. Admitting these things, we may well ask: How often are changes in plan actually the necessity of indeterminate conditions, and how often are they merely the result of insufficient and perhaps inefficient study of the problem before the plans were prepared for its solution? It is a very common complaint of engineers that they are often prevented from making the thorough preliminary studies that are essential to developing the most efficient and economical plans. Will not the fact of the possible increase in the cost of construction, resulting from changes in the proposed plans after the letting of contracts, lead to more careful and mature study, and hence to an ultimate saving in cost and gain in efficiency? Conversely, may the admitted greater flexibility in this respect of the day labor system of work not be a direct encouragement of hasty and careless preliminary studies? These are legitimate questions and we have not seen them answered convincingly from the day labor advocate's standpoint.

To sum up most favorably, while there may be an occasional piece of work in which the considerations stated may count for something, they furnish a very weak reason for employing generally a method of doing work which experience has proven to be excessively expensive. It is cost that determines the efficiency of a method of doing work and cost is so preponderantly in favor of the contract system as compared with the day labor system that the latter falls little short of economic absurdity.

Design of Small Intermittent Sewage Filters

Satisfactory Solution for Communities of less than 10,000 Population—Suggestions Regarding Sedimentation Tanks, Dosing Chamber and Other Matters*

By Paul Hansen

Where conditions are favorable, the plant should comprise four principal parts: a screen chamber, sedimentation basins, a dosing chamber equipped with automatic dosing apparatus, and at least three filters.

The screen chamber need be only a comparatively small structure. For plants having capacities as high as 500,000 gallons per 24 hours, the chamber need be made only large enough to give convenient access, say 5 feet wide by about 12 feet long. In this chamber should be placed a screen, or preferably two screens, held in inclined grooves sloping at an angle of about 60 degrees, with the horizontal toward the incoming sewage. These screens should be made up of substantial iron bars supported in a frame at the ends only, and vertically placed. Such construction minimizes the difficulty of cleaning the screen by means of a rake. There is some difference of opinion as to the width of open space that should be permitted between the bars of the screen, but ¾-inch openings seem to give satisfactory results. A good arrangement is to use two screens, one with 1-inch openings and the other with ½-inch openings, the finer screen being placed beyond the coarser. Beyond the screens in the screen chamber should be placed stop-plank grooves, in which may be placed a weir for measuring purposes if desired. The lower end of the screen chamber may be occupied by two gates, one leading to the sedimentation tanks and the other leading to a by-pass to the stream. The actual minor details of the screen chamber, of course, permit of great variation.

Sedimentation Tanks

The sedimentation tanks should be rectangular in shape, have a depth to the flow line of not less than 6 feet, and have a capacity of about 10 hours' flow, based on the nominal capacity of the plant. In order to provide some elasticity in the operation of the sedimentation tanks, due to variations in sewage flow, it is well to divide these tanks into several independent units. A convenient method is to employ two units, one having twice the capacity of the other. This arrangement permits of using three sedimentation periods having a ratio of 1 to 2 to 3. The tanks should have a length of at least twice the width for the purpose of inducing a more even flow and facilitating the deposition of sludge. There should be placed at the inlet and outlet end devices for distributing the inflow and outflow across the width of the tank. Baffles variously placed with the tank are sometimes of advantage, but in the present stage of the art it is not possible to recommend as best any specific arrangement.

One very important point in the design of sedimentation tanks is to provide ample slope in the bottom of the tanks for sludge drainage. A slope of 5 per cent., if obtainable, is none too much. Provision should be made for receiving sludge on a so-called sludge bed which is constructed essentially like intermittent filters (to be described later), and should have an area capable of receiving the entire contents of the larger sedimentation tank without exceeding a depth of about 9 inches. The matter of covering the sedimentation tanks is a much mooted question. In general, it may be said that where the purification works are far removed from habitations and occasional odors will not prove objectionable, covers are not necessary. Where the plant is near habitations or in plain view of public highways, covers are certainly advisable. The covering, however, has nothing to do with the successful operation of the sedimentation tanks. A covering, of whatever design, should permit of ready accessibility to all parts of the interior.

There are a few small plants of recent construction in which sedimentation tanks having comparatively short periods of flow are used. These tanks are constructed with hopper bottoms, and are preceded by arrangements for thoroughly screening the sewage. While such tanks give excellent results, they require considerable attention for the reason that the sludge must be discharged about once daily in order to avoid ebullition due to septic action, and moreover, the screening process must be frequently looked to. For these reasons Mr. Hanson, believes that this type of sedimentation tank is not the most satisfactory for small installations.

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*Extracted from paper read before the Ohio Engineering Society

Dosing Chamber

The dosing chamber should be of sufficient capacity to discharge a dose of sewage which will cover one of the filter units to a depth of between 2 and 3 inches. It is not considered good practice to exceed 3 inches. The discharge of the dosing chamber may be, of course, diverted to the various filters by hand, but in the case of small purification plants this is not practicable for the reason that caretakers cannot be kept constantly on the ground. It is therefore preferable to install some form of discharging device which will automatically discharge the contents of the chamber on to the several filters in rotation. It should be borne in mind that all types of automatic apparatus may at times get out of order, and therefore should have the periodic attention of an intelligent caretaker. The depth and size of the dosing chamber is governed by local conditions, principally the head available. It is scarcely practicable, however, to construct a dosing chamber of less depth than 2 feet. The dosing chamber should be provided with a cover of some sort for the protection of the automatic apparatus. The most preferable form of lovering is a well-lighted superstructure.

The intermittent filters may be prepared in a great variety of ways. The simplest form is obtained in those cases where a suitable filtering material is found in situ. It then becomes necessary to level the ground, build dividing embankments, and place rows of underdrains at a depth of not less than 4 feet. Suitable distributing apparatus may be built for distributing the sewage over the several filters In the great majority of cases, however, especially in Ohio, it is necessary to transport the filtering material. In such cases, owing to the greatly increased cost, it is of advantage to construct the beds as substantially as possible in order to increase their effectiveness, thereby prolonging the usefulness of the plant.

Concrete Walls Better Than Earth Embankments

The best method of dividing the area into beds is by means of concrete walls. This has the advantage over earth embankments in that the material composing the embankments will not be washed on to the surface of the sand. Further, they present a much neater appearance and do not greatly exceed the cost of embankments. The bottom of the beds may be prepared in the natural soil and they should be carefully graded toward the lines of underdrains. The distance between lines of underdrains may be made about 15 feet. The underdrains should be laid carefully in regard to line and grade and should be made of vitrified sewer pipe with bell ends. The space between the socket of one pipe and the spigot of the next adjacent pipe should be from 3/8 to 1/2-inch, thus permitting the free entrance of water. Each joint of the underdrains should be carefully surrounded by gravel varying from coarse adjacent to the joint to fine at a foot or so away from the joint. The underdrainage of the beds should be supplemented by a layer of gravel covering the entire bottom of the filter. This gravel should be of sufficient thickness to thoroughly cover the underdrains and should have a minimum thickness between the lines of underdrains of about 3 inches. The size of the gravel should vary from about 1/2 to 1 1/2-inch. The upper surface of the gravel layer should be accurately level. In order to prevent the superincumbent sand from working its way down into the gravel it is advantageous to top off the gravel layer with an inch or so of very fine gravel, say such as would have diameters varying from 1/8 to 1/4-inch. On top of the gravel should be placed a bed of sand having a thickness of not less than 3 feet. This sand should be practically free from loam, calcareous and argillaceous matter; in short, it should be a clean, silicous sand. The exact size of the sand is not a matter of great importance, but, if available, a sand should be used having a uniformity coefficient not exceeding 3, and an effective size which may vary from 0.20 to 0.50 mm.

A bed constructed in the manner above indicated will produce an excellent effluent with a population tributary of about 1,000 per acre, which, under normal conditions, should represent a sewage flow of about 100,000 gallons per day. It is not always possible to obtain a filtering material of the above-described quality, and when this is the case somewhat larger areas must be used. But under no circumstances should a material be used which is of such poor quality as to have a tendency to cake and crack. In certain localities where sand is very expensive it has been found feasible to obtain satisfactory results by the substitution of fine cinders. In such cases, however, great care must be exercised in obtaining a suitable grade of material. It seems on the whole that locomotive cinders are most preferable in point of perosity and durability. The surface of the sand or other filtering material should always be maintained accurately level so as to promote an even filtration over all parts of the bed. In the past, distribution troughs having a large number of openings have been in considerable favor, but recent experience seems to indicate that some means whereby the sewage may be conveyed to a few points on each filter is preferable. Perhaps it would not be wise to have more than 2,500 square feet of filtering area supplied at one point of discharge.

The Number of Filters

The number of filters to be used is a matter that requires some consideration. As already noted, there should be a minimum of three, which permits of two beds being used alternately while the third is remaining at rest for cleaning or other purposes. As plants increase in size this small number of beds becomes somewhat impracticable. Moreover, it is advisable to have the area divided up in smaller units so that at no time will there be a large percentage of the plant lying idle. There is also a limit to the number of beds that may be used, imposed by the increased complexity of the automatic apparatus. A convenient division for a one to four-acre plant is about six beds; for larger plants more beds are desirable.

Local conditions sometimes make it necessary to vary somewhat the general designs described above. Such variations are almost always imposed by local topography. In this connection there are two principal cases where the plant must be built under conditions permitting the least possible loss of head, and where pumping becomes necessary.

The head lost by sewage passing through a purification plant of the intermittent sand filter type may, of course, be somewhat reduced by giving the dosing chamber the minimum depth practicable. There are cases, however, where a dosing chamber cannot be installed at all. The difficulty may be overcome through the [illegible] will be necessary in the first place to divide the filtering area into a large number of small beds, each bed being of such size that the normal flow of sewage will cover its surface to a depth of, say, about 2 inches, within half an hour, thus acting in effect as a dose discharged from a dosing chamber.. Also special effort should be made to obtain a good distribution of the sewage. An automatic apparatus for diverting the sewage to the various beds would be extremely complicated on account of the large number of beds involved. It is possible, however, to arrange the beds in groups of three or four each, whereby it becomes practicable to design an automatic diverting apparatus requiring but 8 or 10 inches loss of head, which will divert the sewage in rotation to each of the several groups. The discharge of sewage on the several filters of a group may be regulated from a suitably placed manhole by means of hand-operated gates. The procedure would then be to have the attendant change the valves in the manholes tributary to the beds of each group once or twice daily.

Pumping Installation

Where pumping is necessary there are two points at which the pumps may be conveniently placed, between the screen chamber and sedimentation tanks, or at the outlet of the sedimentation tanks. The preferable location in any specific instance will, of course, depend on local conditions. If the former method is selected it is advisable to secure a very thorough screening of the sewage before it is admitted to the pumps. The most convenient pumping installation for small sewage purification plants is one consisting of electrically operated centrifugal pumps. While such an installation should, of course, receive the daily attention of a caretaker, yet the pumps may be automatically thrown in and out of service by means of reliable devices.

In order to produce a fairly even flow of sewage through the sedimentation tanks, it is advisable to install pumps of small capacity and in multiple, so that pumping will be continuous. During periods of small flow perhaps only one pump will be in service, whereas during periods of high flow two, three or four pumps may be in operation. It is highly advantageous to place the pumps in a dry well where they are readily accessible for inspection and repair.

Where the pumping station is placed beyond the sedimentation tanks somewhat different conditions are encountered, for in this case fine screening is not necessary, the pumping should be intermittent rather than continuous, and therefore the pumping machinery may consist of a few units of large capacity. The pump well of such a plant may advantageously serve as a dosing chamber, that is to say, the pumps should be so adjusted that they will not pump until a sufficient quantity of sewage has accumulated to flood one or more filters. Then the sewage should be removed rapidly until the pump well is empty. It is not practicable to operate such an installation electrically unless the power is obtained from a large station. On the other hand, the fact that the pumping need be done only intermittently renders other forms of motive power feasible without requiring the constant presence of an attendant. For example, an internal combustion engine may be used. Aside from the difference in pumping machinery and capacity of reservoir, a pumping station placed beyond the sedimentation tanks need not differ materially from one placed before the sedimentation tanks.

Vancouver, B.C., is rushing municipal work this season. About 1,500 men are reported to be on the city's pay roll.

Hot Water Heating at Boiler Level

A preference in heating work can be secured by the man who knows what can be done with different kinds of heating systems, and it is strange to me that more men do not show their customers how rooms in their buildings on the same level with the heating apparatus can be satisfactorily heated. Frequently portions of buildings available for transacting business or doing work cannot be used during the cold season from the inability to make it comfortable. Regardless of the kind of heating system used, these rooms can be heated if the heating contractor knows how to do it.

It is my intention to deal in this article with hot water heating, but before passing to it I want to state that in numerous instances I have taken a pipe from the top of a warm-air furnace and run it along the ceiling and attached it to a register in the side wall of a room on the same floor on which the furnace stood. This brought the hot air for heating the room in near the ceiling, and that is the place where the hot air always rushes wherever the point of delivery may be. Then I have taken a return pipe from a register in the floor of the room on the furnace level and carried it to the furnace so as to keep up a circulation.

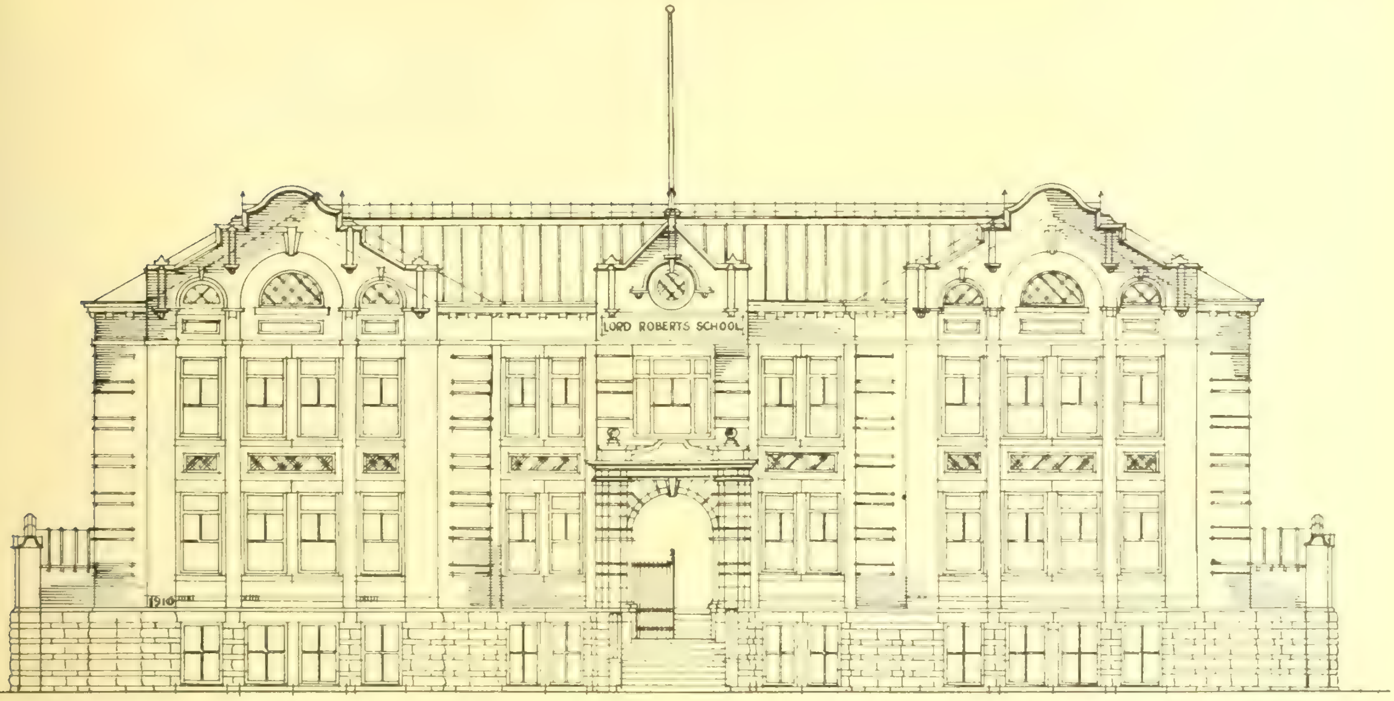
With steam heating apparatus, hot water radiators may be placed on the side walls at about the boiler level and the condensation returning from radiators on the upper floors can run through these radiators to heat them. If a small pressure is carried on the steam system the radiators may be used for steam, with a return trap to throw the condensation back into the boiler, or a steam loop may under some conditions be used for the same purpose.

It adds to the prestige of the man in the heating business to be able to do these things for his customers. There is as little difficulty in heating rooms on the same level when hot water is used and it has enabled me to make sales of heating apparatus where I otherwise would not have had the business. My customers have derived comfort and had the advantage of using every portion of their building for whatever work their employees might be engaged in. It is not necessary to carry the hot water up from the boiler to radiators on the floor above it and let the return water from these radiators circulate down through those on the lower floor if the mains to the radiators on the lower floor are of ample size to facilitate circulation and if they are correctly aligned, so the water will move through them with sufficient rapidity to do effective work.

At present I am heating a store building in which the basement is used for packing and shipping and some clerical work. The mains for the radiators upstairs are run independently of the work to be done on the boiler level, and the piping for the radiators on the first floor is done independently of the fact that the heater is connected with radiators in another part of the building. The piping is arranged to prevent the mains from becoming air bound and the work is giving satisfaction.

In another case a much larger building of several storeys is heated with a hot water system and the entire basement in which the heater is placed is taken care of by radiators located as they should be and piped to secure a circulation through them. It will be a good thing for heating contractors to devote some of their time to a study of the operation of such plants, because it will ultimately result in bringing a profitable business to them.

Kenora, Ont., reports vacancies for stone dressers and a scarcity of brick.



Lord Roberts School, Winnipeg Front Elevation

The Lord Roberts School, Winnipeg, Man.

A Noteworthy Example of the Modern Educational Buildings Now Being Erected in the Western Metropolis—Features of Design and Construction

This school, now being erected in the southwest part of the city, will cost, exclusive of heating and ventilation, $76,000.

The ground and second floors provide for twelve classrooms, together with principal's room, teachers' rooms, "rest" room and library. In the basement there are provided four classrooms, two of which are equipped for manual training. On this floor are also located toilet rooms and shower bath rooms for both sexes, together with space for heating and ventilating apparatus.

Entrance to the building is gained on three sides, all leading to the main corridor, which is 24 feet wide. The two side entrances enter direct into the two main stairhalls of the building. These stairhalls, which are 10 feet wide, are enclosed in brick walls the entire height of the building; and all openings from same are provided with kalomined doors fitted with spring checks, and having wired glass in panels, and fanlights. The stairs are of iron; landings, reinforced concrete; treads and landings finished with Terrano covering. All entrance and vestibule doors open out, folding back against side walls, thus giving a clear unobstructed exit from the building.

The construction of the building is as follows: Basement walls of stone on concrete foundations, rock-faced from grade level to ground floor line, solid brick walls above, all lined on the inside with hollow brick to preserve plastering. All the interior walls are of brick.

All three entrances, floors of corridors on ground floor, landings of stairs, floors over manual training rooms, and roofs of boiler room and fuel room, also lintels over all openings in walls, are of reinforced concrete. All other floors throughout the building are constructed with short lengths of wood joists, carried on iron beams. Finished flooring of ⅞-inch maple is put down in all classrooms, teachers' rooms, corridors on ground and second floors, and manual training room in basement. Tile flooring of 4 x 4 Red Walsh quarries is installed in toilet rooms, shower bath rooms, entrance landings and vestibules. Metallic ceilings are used throughout, except where reinforced concrete floors occur. The roof of the building is covered with galvanized iron. All electric wiring is laid in conduits.

Two low pressure boilers supply the direct radiation to the various rooms, and mechanical ventilation is also installed. Fresh air passes through tempering coils, water air washer, and reheating coils, and is supplied to all rooms through brick flues by a 140-inch blower, driven by an electric motor, the temperature of the air being controlled by automatic regulators. An exhaust fan driven by an electric motor provides for the special ventilation of the toilet rooms.

This building is being erected according to the design and under the direct supervision of Mr. J. B. Mitchell, Commissioner of School Building.

Lighting the Country Home

"Ten years ago," says "Beautiful Homes," "it was customary for the man who was showing his country home to his friend from the city, to say, apologetically, 'Of course we haven't the conveniences here that you have in the city, but you can't expect to have everything you want when you live so far away from the city.' In recent years, however, modern progress and invention have given more serious attention to the home in the small town, and there is a growing disposition on the part of the man who dwells 'far from the madding crowd,' to insist on just as much comfort as his city brother. It is now no uncommon occurrence to find a country home equipped with bathrooms, hot and cold running water and lighting gas piped into every room in the house."

For lighting the home, several plans have been devised, and among them is a combination gas machine, which gives the home what is really a gas plant on the premises. The invention can be set up in a corner of the basement or cellar, and requires little or no attention at all, once it is properly installed. It supplies a gas that is perfect in its illuminating qualities, to the different rooms of the house, and, like city gas, it can be used for both heating and lighting. Ordinary burners, open or fitted with the usual gauze mantel, are used for lighting, and the light produced is clear, white and brilliant.

The fuel used is gasoline, stored in a combination fuel tank, buried in the ground outside the house. In most cases it requires to be filled with fuel about once every six months, and requires no further attention. The principal parts of the machine are a pump which works with a weight, and is wound up in a few minutes every few days, and an automatic mixing regulator, which needs no attention whatever.

Experience has demonstrated that gas can be produced by this method at a cost not to exceed $1 per thousand feet. This makes the cost of light at an 80 c.p. burner about one- fourth of a cent per hour. This is certainly very cheap, much cheaper than the average city dweller can purchase his light.

Roman Ceramic Pavements

The past few years have seen a considerable change in the opinion of most people as to what should be a suitable kind of flooring for the halls and vestibules of large buildings, and, strange to say, there is an almost universal concurrence of opinion that ceramic tesserae, used in the fashion adopted by the later Roman architects, are about the most suitable for the purpose. Fortunately, the art of making ornate mosaic pavements is not lost, though it is doubtful whether modern designers study the ancient methods sufficiently close to enable them to get the best results, says a writer in "Brick." Any design intending to represent an actual fact must in almost all cases fail, for the simple reason that, for pavement work, the design is too close to the eye and looks unreal. Therefore, conventional work is preferable, and it is difficult to surpass the effects produced by the Romans in this respect.

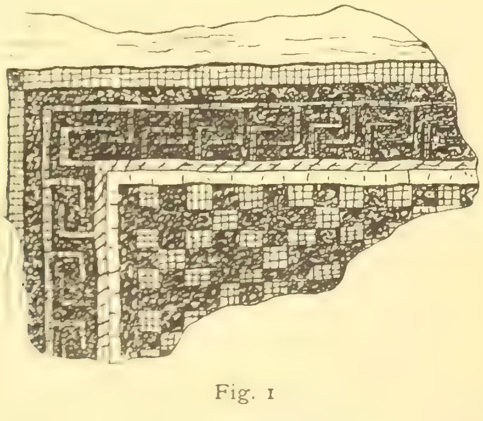


Fig. 1

To take a few hints from the Roman method of handling this mode of decoration, we may first allude to the remains found in the ancient Roman city of Uriconium, at Wroxeter, in Shropshire, as described some years since by Judge Horatio Lloyd. The panels of the pavements in this case were about 8 feet x 11 feet, and the tesserae of which they were composed were about ¾-inch square.

Fig. 1 shows the mode of their arrangement in rather ornate form. It will be observed that the tesserae forming the border are of approximately the same size as those employed for the smaller squares towards the centre of the design, but not so large as those on the innermost side of the border. This has the effect of bringing the pattern into relief, so to speak, and is characteristic of ancient Roman work in general.

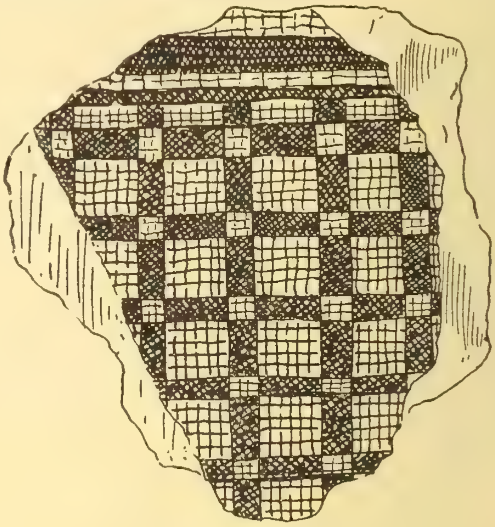


Fig. 2

Fig. 2 does not exhibit such an artistic design, but is none the less effective, and, while this type of ornament is by no means rarely adopted at the present day, it should be remembered that we owe it to the ancients, especially to the Roman workers in ceramics. The double white border with two rows of tesserae, and the long quadrangular pieces with three rows next to it, are not the least interesting parts of this design.

At the annual meeting of the Western Canada Railway Club, held recently in Winnipeg, the following officers were elected: Honorary President, Wm. White (2nd vice-president of the C.P.R.); Hon. Vice-Presidents, E. J. Chamberlain (vice-president and general manager of the G.T.P.), G. J. Bury (general manager of the C.P.R.), M. H. McLeod (general manager of the C.N.R.), and W. Phillips (general manager of the Winnipeg Electric Railway); President, A. E. Cox; 1st Vice-President, G. W. Caye; 2nd Vice-President, R. R. Neild; Secretary, W. H. Rosevear; Treasurer, E. Humphries. This club has met with phenomenal success. It began with a membership of 35. After a little more than a year this was increased to nearly 450.

Mr. Wm. Hurst, who for the last twelve years has been foreman of sewer construction for the city of Winnipeg, has resigned his position and will start business as a general contractor. Mr. Hurst is the inventor of a machine for excavating frozen ground. He built the first concrete sewers in Winnipeg.

The Winnipeg City Council are looking for a suitable paving material for residential and suburban streets which will be something in cost between asphalt and macadam. City Engineer Ruttan will report shortly on his recent investigations into this subject at Monrteal.

The Sewerage Problems of Small Towns

Varying Conditions Encountered not Commensurate with Diversity of Engineering Practice—Special Phases of the Subject Considered

The author was influenced in the selection of this subject by the fact that of recent years there has been an overwhelming amount of matter written on the subject of sewage disposal, but very little on sewerage, and an examination of plans prepared by different engineers shows that there is a greater diversity in practice than can be accounted for by the varying conditions met with. Many of the everyday things of a man's work may appear unimportant to him, but such things are of great value to others younger in age or experience, and it is the details that ensure the successful issue of works, no matter how good the general arrangement of the scheme may be.

Preliminary Work—The first step in connection with a sewerage scheme is to delineate the proposed works in a set of drawings after making the surveys and obtaining information of the physical characteristics of the area to be dealt with. In all cases where the road varies to an appreciable extent from a straight line, the positions of the manholes must be set out on the ground before preparing the drawings, otherwise it will very probably be found during construction that additional manholes have to be constructed to ease the sewers around corners. Such manholes will be close together and probably placed to less advantage for inspection purposes than if they had been provided for in drawing out the original scheme. In preparing sections of roads the author does not consider that spot levels, shown upon the maps, can be usefully employed, but each road must be actually levelled. It is very rarely necessary to chain or measure the distances along the road at which levels are taken. The maps should show the property adjoining the roads in considerable detail, and the position where each level is taken can be located on the plan and transferred to the sections without any measuring at all. When a road is being levelled the author requires that a reading shall be taken on every ordnance bench mark and every existing manhole cover passed, and that further readings should be taken whenever possible on all covers, etc., in adjoining roads, so as to tie the levelling up as closely as possible. Although this adds somewhat to the labor of levelling, the time so spent is amply repaid by the facilities afforded for checking the readings and locating any error. The levels on every section should invariably be referred to ordnance datum. In this utilitarian age, when work has to be turned out at high speed and photo-printing is so universal, the art of draughtsmanship is dying out, but neatness should be insisted on, as carelessness in drawing not infrequently leads to inaccuracy in the information on the drawings.

Capacity of Sewers—The amount of sewage to be provided for in sewers can be estimated with considerable accuracy, but the quantity of rainfall for which provision is to be made varies within very wide limits. It is commercially impracticable to provide for the heaviest rainfall that may occur, although, obviously, if a less quantity is allowed for, flooding of the sewers will take place. The figure selected should be such that the risk of flooding is tolerably remote, while the cost of the sewers is not unduly high. The provision in the sewers may be based on a rainfall over the whole area of the district of which only a very small proportion reaches the sewers, or it may be taken only on the impervious areas abutting on the sewers and allowance made for a larger percentage flowing into them. The latter system is the more scientific and gives more accurate results. Separate storm-water drains are insanitary and expensive, and are generally employed to receive only the water from the roads and the front portions of the houses, leaving the back roofs and yards to be drained by the foul water sewers.

Gradients—Whenever practicable sewers should be laid at gradients which will give a mean velocity of from 2½ feet to 3 feet per second when they are discharging one-sixth of their total capacity. It is not sufficient to wait until the sewers are half full to obtain this velocity. Steeper gradients are undesirable, as they lead to a rapid concentration of storm-water and consequent flooding in the lower parts of the system.

Size of Pipes—It is customary to provide that no public sewers of a less diameter than 9-inch shall be constructed. This adds considerably to the expense of sewering small towns and villages and in some instances makes the cost almost prohibitive. For short branches, pipes of 6-inch diameter would in many cases be ample for carrying off the quantity of liquid they would be likely to receive. The smaller the pipe in comparison to the quantity of sewage, the better the velocity and consequently the cleaner the sewer will be. There can be very little likelihood of a 6-inch public sewer being stopped up by any extraneous matter which can only reach the sewer after passing through the ordinary house traps, the intercepting traps, and a length of 4-inch or 6-inch house drain.

Depths of Sewers—A depth of 6 feet is generally the most convenient. If laid shallower than this it will be difficult to obtain a good fall in the house drains, in both sides of the road, and if the depth is about 3 feet or less, the sewer must be constructed either of stoneware pipes surrounded with concrete or of cast iron pipes, both of which methods are not only expensive in themselves, but add to the cost of making house connections. All sewers over 12 feet deep should be surrounded with concrete to prevent their failing by pressure of the superincumbent earth. When sewers reach 18 feet or 20 feet deep it is advantageous to construct a supplementary sewer at a higher level to receive the connections.

Pipes and Joints—Patent jointed pipes may be divided into two classes—"true invert" pipes and pipes with moulded bitumen rings which fit closely. The advantage of true invert pipes over those with ordinary plain sockets is obvious, but for some reason the majority of contractors with whom the author has discussed their use do not appear to look favorably upon them. In a case where tenders were obtained for some sewers before it was decided what kind of pipes should be used, the contractors were asked to price in a schedule, giving alternative prices for ordinary pipes and true invert pipes, but the prices for the latter laid complete were the higher, notwithstanding that the manufacturers quoted the pipes at the same rate as ordinary pipes. Cement mortar for jointing pipes should consist of two parts cement and one part sand, which gives a strong joint that is not likely to crack in setting. According to information given by the municipal engineer of Elberfeld, the joints in Germany are made with asphalte compound. The pipes, which must be absolutely dry and clean, are placed in position and strands of tarred jute are caulked into the joint. A band of clay puddle is fixed round the pipe, leaving the annular space for the jointing material and melted natural asphalte, at a temperature of about 380 degrees F., is poured, through an opening made in the clay band at the top part of the pipe. The asphalte must be very fluid and free from all impurities which might cause bubbles to form, and the melting tank must be kept closed to prevent the escape of the light volatile oils. Artificial asphalte made of tar compounds has been found to be unsuitable. The quantity of material used is as follows:

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*Paper read before the Institution of Municipal Engineers by Mr. Henry C. Adams.

Diam. (inches)	4	6	9	12	15
Tarred jute (lb.)............	0.5	0.66	0.82	1.43	2.20
Asphalte (lb.)	1.43	1.98	2.92	4.62	6.76

After completion the sewers are tested by an air pressure of from 3.7 pounds to 5 pounds, which is maintained for ten minutes. The pipes are usually made in lengths of one metre, say 39 inches, which is longer than is customary in this country, and it is found that the cost of the sewers is decreased by reason of the fewer number of joints. Pipes over 18 inches in diameter are usually surrounded with concrete. In order to lower the cost of digging and to lessen the liability to breakage the trenches are made as narrow as possible, being 31½ inches wide, which would be about 2 feet between the timbers, for pipes 12-inch in diameter and under, and 35½ inches wide, which would be about 2 feet 3 inches between the timbers, for pipes from 12-inch to 18-inch diameter. These sizes cannot be considered excessively narrow, but in the author's opinion there is much less liability for the sewers to be damaged or moved so as to crack the joints when ample room is given for the men to work, and he does not agree that the trenches should be as narrow as possible. The trenches are filled in to a height of 20 inches above the top of the pipes with selected material free from large stones, which is punned with wooden rammers; above the height the material is filled in as it comes and iron rammers are used. In order that trenches should be properly rammed when being filled in, at least three men should be engaged ramming to two men filling.

Junctions—It is customary in new sewers to provide junction pipes at frequent intervals for connections from any houses which may be erected in the future. It is generally found that when the houses are built it is not convenient to utilize any junction in the vicinity, so that their provision is a matter of needless expense. There are several methods of inserting junctions in sewers after they are laid, of which the best is probably that of cutting a hole in the pipe and inserting a saddle junction, but care should be taken to pass the hand through the saddle and carefully to fill the space between it and the cut edges of the pipe with cement finished off flush with the interior of the pipe. When junctions are left in for future use the sealing of them in the meantime requires consideration. The best results are obtained by using junctions which are closed by a stoneware disc placed in position during the moulding of the pipe and burnt on so as to form an absolute seal until such time as the junction is required, when the stopper can be chipped off by cutting round a groove provided for the purpose. Another efficient method is to use a loose disc which is placed on a rubber or other seating in the socket and secured by a metal clamp around the outside of the socket.

Testing Sewers—There are two methods in vogue for testing the water-tightness of sewers, one with air and the other with water. The disadvantage of the former is the difficulty of locating the leakage, if any, and in the latter the provision of the necessary quantity of water is a serious item of expense, and the subsequent disposal of it is frequently a matter of considerable trouble. Testing delays the progress of the work, and, unless it is done in short lengths, results in an excessive length of trench being kept open, which increases the cost of watching and fencing. Sewers should not be tested before the expiration of 24 hours from the time of making the last joint in each section, and if the works are on the sea coast the cement will take longer to set and an extra six hours should be allowed. If every joint is closely examined the whole of the way round the pipe and any doubtful joint is cut out, chances of leakage will be remote. The maximum internal pressure put upon sewers during testing should be rigidly limited, otherwise more harm than good will result. Although sewers are usually specified to be watertight, they are rarely found in that condition, and any length of sewer which permits the entry of a greater quantity of water than half a cubic foot per minute per mile of sewer should be taken in hand, and the leakage located and stopped.

Manholes—There is no reason beyond the question of expense why the size of manholes on pipe sewers should vary in different towns, as the purposes for which they are used and the size of the men using them do not vary to any appreciable extent. A convenient and reasonable size is 3 feet 6 inches by 2 feet 6 inches, with shafts 2 feet 3 inches square, but if the strictest economy is necessary they may be 3 feet by 2 feet, with shafts 2 feet square. The top of the benching should be practically level with the soffit of the sewer, as if it is built lower sewage matter is deposited on the top of it when there is a big flow of storm water, and in addition the width of the sewage stream increases immediately the sewer enters the manhole, but as it does not decrease with the same facility at the outlet end of the manhole, eddies are set up in the angles which obstruct the flow of the sewage to such an extent that a quantity barely sufficient to fill the pipes will head up in the manhole to a height of a foot or more, which will, of course, increase the pressure in and reduce the flow through the sewer above the manhole. As a preventative against this, the top half of the sewer at the outlet end of the manhole should be formed as a bell-mouth. At those manholes where the diameter of the sewer increases the pipes should be laid so that their soffits are level, and the whole of the drop due to the larger diameter will occur at the invert. In many cases where the carriage of good suitable bricks is a heavy item it is advantageous to build the manholes in concrete. In wet ground concrete manholes will prove more watertight than brick manholes of an equal thickness. There is frequently considerable difficulty in stopping leakages in manholes and many diverse methods are employed from time to time. Manholes built up with cast iron segments are expensive, but are thoroughly water tight; it is, however, useless to build such manholes unless the sewer is composed of cast iron pipes, and even then it is improbable that house drains in the vicinity will be similarly constructed so that they will be the means of subsoil water reaching the sewers and the advantages of the cast iron sewers and manholes will be lost.

Lampholes—Although frequently constructed, lampholes are rarely used for any other purpose than that of ventilation, and unless they are particularly required for this use only, it is better to construct manholes in their stead.

Ventilation—The ventilation of sewers is a vexed question and cannot be dealt with by preconceived rules. The best plan appears to be to fix open manhole covers throughout, and then when the system is in working order, if objectionable smell be observed at any of the manholes, such manhole covers should be sealed and vertical columns erected at those places. If vertical columns are fixed on the edge of the footway, they require to be very tall to allow the gas to escape without nuisance to the occupiers of the adjoining houses, and they become unsightly. On the other hand, the majority of people are very reluctant to give their assent to the erection of a shaft against their premises even if payment is offered for the privilege. It would be interesting to learn and tabulate the methods adopted and the payment, if any, made by various towns. Most of the objections to both columns and open manhole covers are purely sentimental, and the author has known many cases where objections have been continued after the ventilators had been cut off so that escape of sewer gas was impossible.

Branch Sewers—Where branch sewers are connected to manholes they should be arranged at such levels that their inverts are well above the sewage flowing through the main sewer, otherwise such sewage will prevent the branch sewer discharging properly and result in back-pounding of the sewage in it, although the branch sewer may be of ample size.

Flushing—Sewer flushing is necessary when flat gradients occur and the sewers are too large for present need. If chambers are employed, they may be fitted with an automatic siphon or a plain disc valve, and the supply of water may be through a service pipe or from a water cart. If the former method is adopted most elaborate precautions should be taken to prevent the possibility of any direst connection nection between the possibility of any direct connection bebetween the water main and the sewer. Properly constructed flushing shafts with a bend at the bottom are useful at the head of a sewer, but shafts terminating with a square junction are practically useless.

Road Gullies—Much of the grit in sewers which is so troublesome to remove can be prevented from entering by using gullies of large capacity. They should be cleaned out at frequent intervals, and after such cleaning should always be filled up with water so as to re-seal the traps.

Pointers on Estimating Concrete Work

Essential to Have Intimate Knowledge of Special Conditions Obtaining on Work How to Figure Closely and Accurately

One is frequently called on to estimate the cost of various kinds of concrete work, or at least is asked how much a certain job will cost; either for the cement alone or for the entire job, including all material and labor. In figuring on a concrete floor or wall one must know something of the conditions. It is evident that a barn floor which is to support heavy loads will require different figures from those needed for a hen house or dwelling house cellar floor.

Again, the cost of material other than cement varies greatly in different localities. Sand and gravel may cost a few cents per load and need to be hauled but a few rods, or, owing to either its first cost or the distance it must be hauled, it may be quite a large item in the expense. It is desirable that the concrete worker be able to make at least a reasonably close estimate on the cost of any given piece of concrete work. He should at least be prepared to figure out about how much cement will be required.

The expense for labor when using concrete need not be as great as for some other methods of construction since much of the work can be performed by common, unskilled labor under a competent overseer. One need not figure on the entire cost of the lumber used for the forms, as much of this can be used again for some other purpose, unless it is all cut up into short lengths. Again, the cost of erecting the forms may vary greatly on different jobs. I remember, says John Upton, in the "National Builder," one job where some one kept track of this item, and it figured up about 50 cents per cubic yard of wall. This was where carpenters were paid $3 per day. The walls were 18 and 20 inches thick, from 12 to 15 feet high and from 50 to 100 feet long. It was necessary to do considerable bracing and also to build runways for wheeling the concrete. While this job had some unusual conditions, there were about as many things to help toward a low cost for labor as there were to make this a large item, so this price, 50 cents per cubic yard, can be taken as a safe guide for the cost of erecting forms for plain foundation walls, though in some cases it might be too much; and for a high wall having pilasters, too small.

Patented Plank Holders

If some forms of patented plank holders were used the cost of building forms might be lessened, but as these few plank would need to be handled over many times there should be some allowance made somewhere for the labor. Of course, if but a few plank were used there would not be any large expense for lumber to be figured on. The expense of mixing and handling the concrete is another item subject to considerable variation, but it is always a factor to be reckoned on. For walls it generally bears a certain relation to that of erecting the forms, since for high, thin walls both these items would be more than for the same quantity of concrete in lower and thicker walls. Some authorities estimate this item at 3 cents per cubic foot of finished work, and it would seem that this was a fair average.

This gives us 5 cents per cubic foot as the cost of the labor for such work as walls, cisterns, foundations, steps, etc. Let us see what the material is likely to cost. The following figures and estimates are gathered partly from experience and partly from the estimates made by others as a result of their own experience, these latter being largely borne out also by personal experience. After even a little experience one will not expect to have as many cubic feet of concrete as the combined bulk of the different ingredients. The finer materials simply fill the voids between the coarser ones, so the amount of concrete will in no case be much greater than that of the coarser aggregate, and in some cases even less. In a mixture of, say, 1 part of cement and 4 or 5 parts of sand, or 1 part of cement, 3 of sand and 9 of aggregates, the resulting concrete will be a little less in both than the sand or aggregate, owing to the fact that the materials can be and are packed into a smaller bulk after being wet than they make when measured dry and loose.

We will figure that sand or other material to be mixed with the cement will cost 4 cents per cubic foot, delivered where wanted. As cement can be bought for $1.60 per barrel in most localities, we will figure on this basis:

One cubic fot of cement costs 40 cents, as there are nearly 4 cubic feet in a barrel, or 1 cubic foot in a bag. So we have the following figures for material: Cement, 1; sand, 1; costs, 44 cents. This will make 1½ cubic feet of concrete and costs 30 cents per cubic foot. Cement, 1; sand, 3; costs, 52 cents. This will make 3 cubic feet of concrete and costs 17 cents per cubic foot. Cement, 1; sand, 5; costs 60 cents. This will make 4½ cubic feet of concrete and costs 13 cents per cubic foot. Cement, 1; sand, 2; aggregates, 3; costs 60 cents. This will make 3¾ cubic feet of concrete and costs 16 cents per cubic foot. Cement, 1; sand, 3; aggregates, 9; costs 88 cents. This will make 8¾ cubic feet of concrete and costs 10 cents per cubic foot. Cement, 1; sand, 5; aggregates, 9; cost, 96 cents. This will make 9½ cubic feet of concrete and costs 10 cents per cubic foot.

Some one has figured out that concrete mixed 1, 2, 5 will require 1½ barrels of cement to the cubic yard, and 9-10 barrel if mixed 1, 3, 7½. So for ordinary foundation walls we may safely figure on 1 barrel of cement for each cubic yard of wall. As to the prices obtained for work we have in mind a figure of $1.85 per lineal foot for cellar walls for houses. This, of course, would mean 7 to 8 feet high, 12 to 18 inches thick, would include everything and require a first [illegible] job, comparing with the best work in stone and costing [illegible] as much where stone is abundant. To these figures we must add the cost of the needed labor of mixing and handling, also that of erecting the forms if this is a considerable item.

In actual work the following figures hold good for stable floors. One barrel of cement lays 50 to 60 square feet. For floors, walks and similar work the surface covered by a barrel of cement depends on the thickness of the work as well as on the proportions used.

Figuring mason's wages at $4 per day, common labor at $2, cement at $2 per barrel, I find that stable floors may be put in for 12 cents per square foot. This includes everything, after the large stones to make the foundations and provide drainage are in place.

Sidewalk and Other Construction

Sidewalks will cost about the same figure for material and labor, perhaps a little more, as there are more forms to build. For the sidewalks 1 barrel of cement will make from 30 to 60 square feet. Mixing the bottom course 1 : 1 : 6 and the top course 3 : 5, you may get 50 square feet of 4-inch walk or 30 feet of 6-inch from a barrel. For the labor you may figure at $1.20 to $1.80 per square foot per man per day, depending, of course, on the thickness of the walk and the other conditions to be met.

The cost of concrete blocks may be figured out as follows: With a 1 to 4 mixture you will get nearly 15 cubic feet of concrete from a barrel of cement. This material costs $2.25, making 15 cents per cubic foot for the concrete.

Blocks having an air space of one-third of their volume will cost 10 cents per cubic foot. Those having an air space one-half their volume will cost 7½ cents per cubic foot.

A block 8 x 8 x 16 contains a little more or less than one-third cubic foot, according to the size of the air space. So figure five cents for the material. The labor cost will depend on the man and the machine, but should be about two-thirds that of the material. We figure that blocks may be made and laid up in a wall at 25 cents per cubic foot at a good profit. Common bricks cost more than this.

To estimate the cost of making cement fence posts we must find the number of cubic inches in each post. As the concrete may be mixed 1 : 2½ : 3 of 4 or 5 parts of aggregates be used, we will figure on 1 : 2½ : 4. With these proportions 1 barrel of cement yields 20 cubic feet of concrete when it is packed into the moulds. So dividing 20 x 1728 by the cubic inches in the post gives the number of posts made from 1 barrel of cement. To the cost of the cement must be added the cost of the sand and gravel; also that of the reinforcement and labor. The reinforcement may cost from 2 to 6 cents. The labor will be about 5 cents for each post. The moulds will be still another item to be figured on.

The total cost of the posts vary from 16 cents for one 5 x 3 at the large end, to 28 cents for one 6-inch square at the bottom and half the size at the top.

Standardization of Plumbing Material*

By Eugene S. Willard

At the last meeting of this society, held in Omaha a year ago, I had the pleasure of presenting a paper on the "Standardization of Plumbing Material." The subject matter of my paper met with the hearty approval of this society, and as a result of the reading of the paper and the discussion thereon a committee was appointed from this society to meet with a committee to be appointed from the Manufacturers of Jobbers of Plumbing Supplies. The Central Supply Association appointed such a committee representing manufacturers of soil pipe, and in accordance with a resolution of our society the National Association of Master Plumbers also appointed members of the committee. A meeting of this committee was held and it was decided that actual measurements should be secured from several manufacturers of soil pipe showing the exact sizes of wall thickness, depth of hub and other details for standard and extra heavy soil pipe from 2 inches to 6 inches. After considerable trouble and a lapse of a good deal of time, this information was secured by our committee and has been plotted on charts, and I have no doubt that at the proper time a report on this subject will be made .

I believe that this society should continue to agitate for the standardization of plumbing material, and that while it is wise to begin moderately and perhaps confine the initial efforts to the standardization of soil pipe, that as soon as possible, without working any hardship upon manufacturers of such material, the standardization should extend to fittings as well. I also believe that it is possible to standardize many other articles of use in the plumbing business. We are here in the home of the manufacture of pottery, and there are many persons in Trenton who are much better able to discuss the standardization of sanitary earthenware than I am. This business has developed into a very extensive and elaborate one, and many new designs of sanitary earthenware have been brought out in keeping abreast of the time, and to meet the progress of sanitation. In fact, I believe the manufacturers of sanitary earthenware have been leaders in the development of practical senitation, and in no other place in this country will we have a better or more profitable opportunity to see the improvements that have been made than in Trenton, where the largest and best sanitary potteries are located.

As a matter of fact, some of the staples in pottery are already practically standardized, such as in height from floor, width and depth. I doubt, however, whether it will be possible to change the many conditions which are presented to the plumber by the various problems of roughing-in his work, which compels the potter to carry a stock of various measurements.

It is possible that, in addition to making the standards of which I have already spoken, as well as the spud and sizes of thread, and 5½-inch measurement for the seat post holes, that it would be possible to have the sizes of the trap in closets brought nearer to a standard, and this might be of material benefit.

Laying Hardwood Floors

There is a certain amount of art in doing everything well, even to laying hardwood floors, which some operators do not consider in this light. The popularity of the hardwood floor, with its many possibilities as a decorative floor covering, can be stimulated and made so much more pleasing by the addition of painstaking on the part of the finisher, says Warfield Webb in the "National Builder." Simply laying a hardwood floor is one of the least considerations in connection with the undertaking. It is essential to have the foundation perfect, and the floor must be laid with care and neatness, but the job does not end here, because the finish is very important to a fine piece of work.

The average hardwood floor, unless it is of mosaic, and even then it cannot be perfect, must be planed off and sandpapered and rubbed with considerable care to ensure a job that will be acceptable by one who is a capable judge. If there has been a good foundation to begin with and if the floor has been laid with care in matching the grooves and tongues, and the nailing has been done with the idea in view of making the work passable, then there will be less to do with the scraper and sandpaper. These first considerations are not always adhered to, however, and to neglect them means more labor and trouble, and in the end a job that is not altogether satisfactory.

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*Extracted from paper read at annual meeting of American Society of Inspectors of Plumbing and Sanitary Engineers.

The increasing use of hardwood flooring has given rise to a larger demand for operators to lay and finish it. It is used now in many large structures instead of the old softwood flooring, and in many of these contracts, there is not required the same care in the finish as in office or residence work. This does not permit of careless workmanship, even though the floor is simply used instead of the old style flooring, and the carpenter should understand that there is really more pains to be taken with hardwood floors, in the ordinary sense, than is required with plain flooring. If he undertakes to lay a hardwood floor at all, he should give it his best attention, because one poor job of this kind will mean that he will find it difficult to secure similar work in securing other contracts.

If he has been particular to lay the floor with care, then he must be able to complete the work in the same manner, and this requires, first, good equipment. There are on the market a number of styles of tools for doing this work. For smaller contracts the hand scraper is often used, which is operated by electric power. In using the latter machine the operator must be experienced, or his labor will be without the desired results, because using this machine is handled to advantage only with intelligent operation. However, as the average contract calls for the hand machine only, the carpenter will have little difficulty in using it in a satisfactory way provided he is able to do so with intelligence.

Smoothing down the rough places requires pains, and surfacing the floor can be done by an ordinary workman, but he must have in his mind clearly before him just what this means, so that he can work to the desired end. Simply going over the floor in a haphazard manner is not the method to pursue, because the result will be such as to show only uneven places in the floor, and not a clear smoothness that is one of the charms of the hardwood floor. The proper method to pursue is to begin at one side or end of the room and to work steadily toward the opposite side. One may not find it necessary to smooth every board, but this is where the result will tell, and it is the uneven boards that must be made level so that the entire floor will become level. If the operator endeavors to simply work here and there where he sees or believes he sees, an uneven place, he will find that in the end he has gained nothing that will count for anything toward the proper finish the floor should be given.

With the completion of the surfacing it sometimes becomes necessary to go over the floor, or at least certain portions of the surface with sandpaper, and with this additional labor there should result a very uneven surface, such as can be oiled and waxed, giving the whole the effect of glossiness and evenness that is so much a feature in this work. While some floors are varnished with a fine quality of floor varnish, the majority of hardwood floors that are given a finish at all are first oiled and then waxed, though stains are in some instances applied as well, which is the ideal way to finish a floor of this character.

Where wood mosaic or parquetry flooring is laid the surface is always finished with oils, wax or varnish, and these floors naturally require more labor and care than the plain hardwood floors. This character of work is confined for the greater part to residences, and the operator who undertakes this special line should be experienced, or his work will lack the essentials that will make it a first-class job. In order to bring out clearly the different designs of the woods used in parquetry flooring, the labor must be done with intelligence and in a way that will prove the ability of the workmen. More work will be demanded for this style flooring than others, and on this account no one should undertake such labor unless he can complete the contract in the manner that it demands.

Most any carpenter can lay a hardwood floor but the man who essays to make an artistic job of the undertaking will of necessity be forced to look carefully ahead of him, and to equip himself, not only will good tools, but an equal amount of experience, which cannot be had without practice and study.

Building Apartment Blocks

In view of the increased interest in the building of apartment blocks, we give below the revised building by-law for apartment houses as finally amended for Vancouver city:

(a) The enclosing walls, including the walls of light courts of all apartments or tenement houses having more than three apartments of five rooms each, or fifteen rooms in all (exclusive of bathrooms, closets and pantries on each floor) and being three storeys or over in height (not including basements) shall be made and constructed of brick, stone or like incombustible material.

(b) The floors in such apartment houses shall be of double construction, the first, or under floor, shall not be less than 1½-inch matched or splined flooring covered with two thicknesses of asbestos paper not less than 10 pounds to the 100 square feet, and ⅞-inch matched flooring over the partitions dividing the apartments, also corridor partitions, and the enclosures of stairs and elevators shall be composed of incombustible material, or of not less than 2¾-inch splined or matched wood.

No suite of apartments in such apartment houses except the janitor's quarters shall be installed in the basements. Any building, the ground floor of which is used for stores or mercantile purposes, and having apartment or tenement houses on the floors above, and being over two storeys in height (not including basement), shall not be of lower standard of construction than that defined in subsection 41 of section 13 of this by-law.

(c) All apartment or tenement houses not of fireproof construction and having more than six apartments on each floor shall have a brick fire wall, which shall be constructed as to have not less than a wall composed of one brick thick dividing the building into two or more sections.

(d) All apartment or tenement houses being in height of two storeys (not including basements) and having more than four apartments of five rooms each, or 20 rooms in all (exclusive of bathrooms, pantries and closets on each floor) shall be constructed in accordance with the same standard as that allowed for three-storey buildings.

(e) In any building the ground floor of which is used for stores or mercantile purposes, and having apartments being of two storeys (not including basements) the flooring of the storey or tenements on the floors above and above the storeys shall be the same as that allowed for three-storey buildings.

(f) All rooms, including the bathrooms, shall have one or more windows, which windows in area shall equal at least 10 per cent. of the area of such rooms, such windows shall open to the outside air, and shall be so constructed that at least 50 per cent. of the area of such windows can be opened.

(g) No inside light wells shall be allowed.

(h) All light courts must be extended to the outside walls and in no case shall such walls be less in size than 10 per cent. of the area of the building, except when the buildings in which such light courts are constructed is situated at a corner of two or more streets or a lane, in which case at least 5 per cent. of the area of such buildings must be allowed on the side not abutting on such street or lane.

Mr. Angus Smith, city engineer of Victoria, B.C., will shortly present a special report to his council making recommendations for dealing with the dust nuisance in Victoria. He is now engaged in making a close study of the problem and is writing to a large number of cities seeking information as to remedies that have been applied with success.

Method of Constructing Macadam Roads with Asphaltic Oil Binder

Macadam constructed with heavy asphaltic oil as a binder has of late years come into use for city streets and country roads. The city of Pasadena, Cal., especially, has a considerable amount of this kind of pavement and has found it to be hard, dustless and mudless, and one which the hardest and heaviest automobile traffic cannot ravel. The method of constructing this pavement as employed at Pasadena was described by Mr. S. J. Van Ordum, city engineer, before a convention of the League of California Municipalities.

Preparing Base—The roadbed is first graded, watered and thoroughly rolled with a heavy roller. Stone of a size not larger than 2½ inches in its largest dimension and not smaller than will pass a ¼-inch screen, is then placed to such a depth that after being thoroughly sprinkled and rolled with a 12-ton roller the surface shall be 1¾ inches below the surface of the finished pavement. The depth of this base depends upon the character of the soil, drainage, character and amount of traffic upon the street. The average depth of this base under ordinary conditions is about 4¼ inches, which, with the top surfacing of 1¾ inches, makes a 6-inch macadam pavement.

As the rolling of the broken stone foundation progresses, rock screenings of a size not greater than will pass through a 1¼-inch screen are spread over the surface in sufficient quantities to bind the broken stone foundation and form a true surface.

The idea in placing a binder on the base rock is to partially bind the rock so that it will not be displaced in oiling or placing the subsequent layers of rock. It is not necessary nor is it advisable to thoroughly close and seal all the voids in the rock, for the first coat of oil which is applied to the base would then be unable to penetrate the base.

Upon this base prepared as above specified is then applied liquid asphaltum at the rate of ¾-gallon to each square yard of street surface.

Wearing Surface—A layer of crushed rock consisting of stone which will pass through a 1¼-inch screen and be retained by a ¾-inch screen is evenly spread over the rock base to such depth that, after being thoroughly sprinkled and rolled with a 12-ton roller, it is 1¼ inches in thickness.

Liquid asphaltum is then applied at the rate of ¾-gallon to each square yard of street surface, after which a coat of crushed rock of a size which will pass through a ¾-inch screen and be retained on a ¼-inch screen is evenly spread to a depth of ½-inch in thickness.

The surface is then thoroughly watered and rolled, followed by a coating of liquid asphaltum applied at the rate of ¼-gallon per square yard. After spreading a light coating of rock screenings ¼-inch and under in size, sufficient to absorb all surplus oil and produce a uniform surface, the pavement is watered and thoroughly rolled until it becomes hard and smooth, true to grade and cross section, and free from all hollows and irregularities.

Care should be taken to have the different courses of rock carefully screened and spread uniformly over the street. If crusher run of rock is used the unequal density of the pavement will result in too little oil in one place and too much oil in another spot. The street when completed should have a surplus of rock screenings on the surface, for the sun and continued surface will bring out the oil which, combined with the fine screenings, gives the street the asphalt finish.

A trench cut in an oil macadam is repaired by first thoroughly tamping the base rock to within about 2 inches of the surface, the edges of the pavement next to the trench should then be cut and the space filled with rock and oil which had previously been mixed by hand. A light coating of screenings is then spread over the surface and the whole thoroughly tamped with a hand tamper.

The oil which has been most successfully used has been the heavy crude or topped oils from the Sunset fields near Bakersfield and contains from 75 per cent. to 87 per cent. asphaltum. Great care should be taken in selecting the asphaltic oil, for the success of the pavement depends to a great extent upon the character of the oil used. Especially is this true if a topped or partially refined oil is used. Refineries are negligent in topping oils and often turn out a bad product which is very hard to detect from a first class road oil. It is also economy for them to top the oil in as short a time as possible, heating the oil to a high temperature, and in so doing cracking the asphalt content.

A Mill Building of Cement Brick

A mill building which possesses the unique feature of being constructed entirely of cement brick made upon the ground has lately been completed not far from the site of the landing of the Pilgrim Fathers in 1620. The concern for which the building was erected owned a large bank of clean sharp silicious sand and a bed of gravel containing a liberal per cent. of stone, and it was therefore decided after some preliminary tests of the material to use cement brick. The mill is two storeys and basement in height and covers an area approximately 114 x 430 feet. The bricks were made in four Standard cement brick machines operated by hand, each machine turning out 20 brick at a time.

The mixture generally used was one part cement and three parts sand, although for lightly loaded walls a few brick were made in the proportion of one of cement to four of sand. All brick used on the outside of the building had a facing ⅛-inch thick of one part cement and two parts fine sand, with the addition of 2 per cent. waterproofing for the cement.

In doing the work enough water was used to make a mortar of such consistency that it would hold its shape under compression without flushing water to the surface so as to cause the mortar to stick to the plates. The amount of water used averaged about 8 per cent., and although this amount would seem likely to produce a porous brick, it was shown by tests that the brick so made were quite impervious to moisture. The cement brick formed such perfect bond with the mortar that the resulting wall was practically monolithic. A valuable and interesting feature in connection with the cement brick is the ability to cut it for special places, it being possible to make a cut ½-inch thick for the full length of the brick and width.

For the entire construction work about 2,400,000 cement brick were used, requiring in the making nearly 7,500 barrels of cement. The building is of a mild gray color, and while the possibilities of ornamental work with moulded brick and concrete castings are unlimited, they were not tried in the present instance except as an experiment, for the general design of the building did not call for such detail.

As compared with clay brick, the cement brick show strength under compression of 40 pounds more per square inch and a resistance to disintegration by sand and rain which does not exist in the case of the former.

The new building is known as mill No. 3 and was erected by the Plymouth Cordage Company at Plymouth, Mass. The two other mills of the company were constructed of clay brick, but when the third one was planned the price of such brick was so high as to cause the experiment to be made of using cement brick, but which, it must be understood, is not concrete brick.

London, Ont., shows a slight falling off in building permits for the month of April. Permits last week totalled $104,883, against $177,250 for April, 1909. For the first four months of 1909 and 1910 the totals are $341,530 and $326,715 respectively.

Contractors' Equipment: Its Use and Care

Economy in Proper Selection of Plant—Considerations in the Purchase of Second-Hand Equipment—Repair Parts for Emergency Cases

A great many contracts have been undertaken and finished at a loss, and, in fact, a large number of them have actually been given up, because of an attempt to handle work with equipment which was either insufficient or not of the kind which should have been used for rapid and economical construction.

There are a few contracts awarded for work of colossal proportions for which the contractor usually designs a special equipment. The general rule, however, is that the greater number of contracts are of such a nature and so located that a standard contractor's equipment should be figured in making the estimate.

In referring to a special equipment it is not the idea to convey the impression that the contractor should figure on using a style or class of machinery that is an unknown quantity, but that he should figure on a style of equipment that is particularly adapted to the work on which it is to be used, and one which will effect the greatest saving in labor. In other words, the contractor should make a careful study of the particular job of work and decide on the class of equipment with which he can handle it with the greatest economy and in the shortest possible time. It is in rapid progress that the contractor will find his greatest opportunity to increase his profits.

Proper Equipment to Fit a Job—The character of the work to be undertaken, the general layout of the job, the various operations to be done, and the results to be secured, are the things which should be taken into consideration in order to determine the proper style of equipment to be used. If the work is so situated, and the various operations are confined within an area which will make it advisable to use derricks, and, where such equipment when originally installed will cover and complete all parts of the work without the additional expense of changing and resetting, then a plant of this character would be about as economical and effective as any installation that could be made.

In the case of concrete work and the proper equipment for handling it, it is advisable to determine beforehand whether the best economy is in a portable or stationary mixing plant. If the concrete is scattered over a large area the question to determine is whether or not it will be a cheaper plan to use a portable mixer and convey the concrete materials to it, or whether it will be more economical to have the mixing plant stationary and convey the concrete to the forms after it has been mixed.

In the matter of excavation the style of equipment best suited for this purpose should be governed largely by the quantities to be handled and the disposition to be made of same. The contractor should in all cases figure the cost of his equipment installed ready for operation, take a fair average production of such equipment, and make careful comparisons of the cost of output handled in this manner with the cost of such output handled with another style of equipment, and in this way determine the most economical and rapid method of doing the work.

Economy in the Proper Selection of Plant—In the practice of economy, the contractor will find the greatest field for displaying his ability in this line is in the proper selection of his equipment. It is a very good rule for him to observe "not to attempt to do anything by hand which can be accomplished by the use of machinery." As a rule there is sufficient time between the date of the advertisement of a job and the time at which bids are opened to allow the contractor to carefully go over all the details of the work and decide on a class of equipment which will handle everything to the best possible advantage and with the greatest economy. If the work is of a different nature from that with which the contractor is familiar he can investigate similar jobs in the course of construction and decide from such investigation what class of equipment will handle the contemplated work to the best advantage.

In construction work, possibly more than any other line of business, there are so many unforeseen difficulties to contend with that the contractor should prepare himself properly in the beginning to handle his work in the shortest time possible. As an illustration, we will assume that a contract has been undertaken for the erection of a building which requires a considerable amount of excavation for foundations, and that the location is such that the banks will have to be supported and an adjoining structure will have to be protected. While the quantity of excavation to be handled may amount to considerable in yardage, the contractor may figure that he can handle it with more profit to himself by doing the work by hand. He might be justified in this provided no unforeseen difficulties arise to delay the work. However, after he has the work well under way he may be delayed by several days of continuous rain, which will cause his banks to cave and possibly a wash under the foundation of the adjoining structure, allowing it to settle, cracking the wall of the building, or, as has happened in a great many instances, causing such structure to collapse. Accidents of this kind could no doubt be avoided in many cases if the contractor had studied the situation thoroughly and provided himself with an equipment for doing the work in the shortest possible time, knowing that the delay of a day might mean a serious loss in handling this part of the work. If an accident of this kind does not "break" the contractor, it will at least take all his profits on this particular job and in all probability a great deal more.

In the case cited above, if, instead of attempting to handle this excavation by hand and hauling the dirt away in the old-fashioned wagon, the contractor had supplied himself with a steam shovel and the latest improved dump wagons, he in all probability could have finished this part of the work and had his foundations built in time to have prevented an accident of this kind.

Again, while the work in question may have been prolonged by reason of an attempt to handle the excavation by hand, and at the same time this part of the work may have been completed without any delay further than the difference in time between a hand and a machine operation. The work may have advanced to the point where the concrete foundations were being laid, and, instead of handling this part of the work with a mixing plant capable of producing a good daily output, the contractor may have attempted to mix his concrete by hand, thus preventing the rapid progress that should be made on a job where the conditions are such that a delay of days or even hours may mean a heavy loss.

The illustration is given merely to call attention to the fact that when conditions of this kind exist it is best to adopt a rapid means of handling the work, even at some sacrifice of profit, rather than to attempt to accomplish it by a means which may seem to allow a little additional profit but in which the delay is likely to result in a serious loss.

Misfit Equipment—It is a comparatively easy matter for a contractor to spend a large amount of money on equipment and at the same time get his work loaded down with a class of machinery that is not at all adapted to the particular work he has to handle. This can be avoided if he has profited by his past experiences from which he should be able to determine the best class of equipment for handling work under conditions as they exist. If his past experience has not been such that he has a personal knowledge of the best class of equipment to be used he can, by a little investigation find out the style of outfit that will answer his purpose best. An improper equipment is worse than insufficient equipment if such a thing is possible, inasmuch as it represents an additional and unnecessary outlay of money, and an increased cost of production and delay on the work. The contractor should be careful to see that he has the latest and best machinery and that it is properly placed, thereby requiring the least number of changes during the progress of the work, and also be sure that he does not have a lot of surplus or misfit equipment to handle and contend with, all of which increases his costs of production and occasions unnecessary delays.

New vs. Second-Hand Machinery—There is little need to call attention to the difference in results obtained by the use of new equipment as compared to those obtained by the use of second-hand equipment, even though the latter is in better shape than the average second-hand condition, unless it would be to bring it to the attention of the contractor on smaller work who has used nothing but second-hand plant. It is not always advisable to purchase new equipment, as it is often possible to secure plant that has been previously used but which is in condition good enough to justify the contractor in placing it on his work and which can be purchased at a great saving over the cost of new. He should, however, know the exact condition of such equipment before he invests his money in it, as a piece of machinery that has been worn out on previous jobs is an expensive addition to any contractor's plant, even though it might be secured without any initial cost whatever. A piece of machinery of this kind is practically out of commission when needed most; and, even if it is not out of commission, the repair bills will in the end amount to as much or more than the original cost of a new machine of the same kind, to say nothing of delays which it occasions.

It is usually the best policy, if the volume of work will permit it, to equip a job with new machinery; but if this cannot be done it is certainly advisable to see that the second-hand equipment is in such condition that the service required of it on the job on which it is to be used can be secured without constant delays, repairs, etc., by reason of its bad condition.

Use of Accumulated Equipment—All contractors who have been in the business a few years find themselves with quite an accumulation of equipment on hand, in good, fair and poor condition. In figuring on a new piece of work it is, of course, good economy to use as much of the accumulated equipment as possible, but a great many mistakes are made by contractors in trying to make use of practically everything they have on hand regardless of its condition. No matter how much equipment a contractor may have idle, if it is not adapted to a piece of work which he is trying to secure, he will find it more profitable not to include it in his estimate, but to allow it to remain idle or dispose of it to the best advantage and figure on equipping his work with something that is especially suited for handling it properly. Do not at any time load up a job with improper or worn-out equipment simply because it happens to be in the storage yard. This is the poorest kind of economy and, in the end, most expensive.

Original Installation—While in some cases it is not possible to locate the plant in the original installation so that all the operations can be performed without rearrangement, changes, etc., this should be done as nearly as possible so as to avoid the expense incident to such changes. The dismantling and re-erection of derricks, boilers, etc., is expensive and causes considerable delay in the progress of the work; and, in a great many cases, such changes could be avoided entirely if sufficient thought had been given to the proper location at the time of the original installation. There are, of course, a great many jobs that can be done more cheaply by using a style of equipment where it is necessary to make such changes than it could be done with a more elaborate equipment where changes would not be necessary. It is merely a question of estimating the total cost of a plant where such rearrangements will have to be made and comparing this cost with the cost of another style of plant where the original erection cost is the only installation expense.

Equipment of Proper Capacity for Output, and Maximum Loads—The contractor should never make the mistake of installing an equipment on his work that is not of sufficient capacity to handle the output for which it is intended to the best possible advantage. It is a very serious mistake to attempt to operate an engine or engines requiring a boiler capacity of 100 h.p. with a boiler from which but 80 h.p. can be secured. If your requirements are 100 h.p., your boiler capacity should be fully that much or, better, 120 h.p.

If your concrete is such that a one-yard mixer is required to produce the proper output, do not try to handle the work with a half-yard or a three-quarter-yard mixer. It would be much better to use a 1½-yard machine, which will avoid the necessity of working it at any time beyond its rated capacity.

If the rated capacity of your derricks or hoisting machinery is five tons and the work is such that your maximum loads will exceed that weight, do not try to get through with an equipment that is constantly required to work beyond its rated capacity. This is especially true in the case of derricks or similar equipment for lifting and handling heavy loads. You are not only taking the risk of demolishing your plant, but the safety of your employees should be given proper consideration. While a machine which is operating all, or most all, of the time beyond its capacity may get through without an accident that will put it out of commission entirely, or cause the loss of life of some of the workmen, there is always the delay and expense incident to minor breaks of parts such as fittings, lines, booms, etc.

In the case of boiler equipment there is always the additional expense of excessive fuel consumption when they are required to constantly carry a load beyond their rated capacity. It is, of course, expected that any piece of machinery will at times be required to do more than it is designed for, but where an entire plant, or an important part of it, is installed when it is known that the capacity is insufficient to accomplish what will be required of it, it is a big mistake and the contractor should avoid an installation of this kind.

Purchase of Second-Hand Equipment—Mention has been made in a previous paragraph regarding the use of second-hand equipment as compared with new. A contractor will sometimes find it advisable to make use of second-hand equipment rather than to go to the expense of purchasing new plant. This is more especially the case on a job that is not of sufficient size to permit the allowance of a sufficient amount in the estimate to cover the purchase of new equipment, even though the quantity required may be small. However, when the contractor figures on making use of second-hand equipment, if it is something he has on hand, he should include in his estimate an amount to cover such machinery sufficient to put it in place on the job in the best possible condition. He should make a deduction from the first cost of such equipment sufficient to cover the previous service which has been secured from it. He should also be sure not to put any machinery on his job that is not in sufficiently good condition to hold out and perform his work properly until same is completed. If it is necessary for him to purchase such second-hand equipment he should only do so after a personal investigation of the condition of such plant, and the investigation should be made by some one competent to judge same correctly. Much delay and additional expense is incurred in attempts to make use of second-hand equipment that is not in condition to be of any service whatever.

Inspection and Care of Plant—One of the principal things that a contractor should bear in mind is that in order for him to obtain the best service and the greatest possible good out of his equipment he should see that it is frequently and regularly inspected with a view to keeping it in the best possible working order and to prevent accidents before his plant has been allowed to go too for without attention. Inspections, if regularly made, will in a great many cases prevent serious breaks and the consequent delays to the work which follow by reason of them. A contractor's equipment must necessarily be exposed to all kinds of weather conditions, as most of it is usually erected in the open and consequently cannot have the protection which machinery should have to preserve it properly.

The proper care of equipment is a thing that a great many contractors seem to pay little or no attention to. Quite often the machinery, after being erected, is practically allowed to take care of itself. In view of the fact that equipment on a contract job has to be erected comparatively in a temporary manner, all efforts should be made to care for it in the best way possible. In too many cases lines, sheaves, and equipment of this character are allowed to run exposed to all kinds of weather conditions with no effort being made to keep them properly greased and oiled in order to obtain the best results and preserve their life. All cables, sheaves, etc., which are required to perform heavy duty should be kept thoroughly oiled and special attention given to a good grade of lubricant for this purpose. The costs of lubricants, even if used to excess (which is far better than using none at all), is insignificant when compared to worn boxings, cut-out bushings, broken lines, etc., caused by using too little or no lubricant. When a piece of machinery is set aside it should be thoroughly gone over and properly oiled instead of being allowed to stand in the weather unprotected to be damaged by rust. Cables and lines when taken down to be stored should be thoroughly protected by being given a good coat of heavy grease. If proper attention of this kind is given equipment, far better results can be obtained while it is in use, and the life can be increased, in a great many cases, at least 100 per cent.

Repair Parts for Emergency Cases—If it were possible to secure an individual record, the cost of delays occasioned on construction work, more especially on jobs in isolated locations, by reason of the absence of extra repair parts, the amount would be almost beyond belief. In all, or most all, classes of equipment there are more or less parts that are constantly wearing out or breaking, and if the contractor will make a point of having a supply of such parts on hand he will find in the great majority of cases, that the time saved by such precaution will pay for itself many times over in the course of almost any piece of work. The matter of an expenditure of $200 or $300 for extra repair parts is a good investment even though he may have use for but few of these parts during the progress of his work. If, however, he does not have such parts on hand a break is likely to occur at any time that will shut down the entire work a sufficient length of time to more than pay for three or four times the amount of spare parts which he should at all times have on hand for emergency cases. Repair parts which should be kept in stock are always standard, and although there may be no use for some of them, the benefit to the contractor of having them on hand, should an accident occur requiring their use, can hardly be estimated.

Duties of Engineers, Plant Operators and Master Mechanics.—All employees whose duty it is to handle and operate the equipment should be thoroughly impressed with the idea that their greatest duty is the proper care of that portion of the machinery which they have directly in their charge. A great many engineers and others, having in charge of the direct operation of a piece of machinery, seem to form an idea that the only thing required of them is to work their machine to its utmost capacity without giving any attention whatever to the condition or proper care of it. In the case of engineers, it is very frequently found that when a man has acquired sufficient knowledge to open the throttle and apply the brakes he represents himself to be an engineer and quite often it is found that he has no idea whatever as to what the machine he is operating is capable of doing, neither does he know anything regarding it outside of the throttle and brakes. If a man has learned to be a good operator, and the contractor finds that he knows nothing about his machine, he should be given proper instructions along this line, and given to understand that he will be required to keep his machine in proper condition. If he is the right sort of a man he will very quickly learn that this part of his work is of greater importance than merely being able to operate the machine while it is in good condition.

The master mechanic should make regular and frequent inspections of all the equipment on the job and at all times see that the operators have their machinery in a condition to give the best possible service, and also see that everything is looked after at the proper time in order to prevent breaks and accidents and not allow machines to be run until they go to pieces for lack of the proper attention.—"The Contractor."

Remarkable Church Roof

Reinforced concrete construction is gaining favor with architects for the construction of church roofs, the principal advantages being the practicability of constructing large barrel and domical roofs without unsightly trusses, tie-rods, etc., and the low cost of upkeep. An interesting example of this form of roof, and one of the first to be constructed throughout of reinforced concrete, is that of St. Aloysius Roman Catholic Church, Glasgow.

In plan the church is of the usual cruciform shape, and the building is faced with red freestone in the classic style, the reinforced concrete roof work being carried on the main walls. The roofs over the nave, transepts, and apse are in the form of semi-circular arches, the nave roof having a clear span of 44 feet 6 inches and a length of 65 feet. The nave roof is supported on arch ribs, reinforced in such a manner as to take the whole of the stress due to thrust without putting any thrust on the side walls, where the load is vertical. The ribs carry a 4½-inch slab forming the roof covering, this slab being reinforced with expanded steel. There are two four-light cupolas in this roof. These act also as ventilators. The roofs over the transepts and apse are of somewhat similar construction but of small span. Three of the main arches carrying the large central dome are of brickwork. The central dome, which is 44 feet by 34 feet, 3 inches, has a radius of 29 feet 6 inches for the first portion and a radius of 21 feet for the upper portion or dome proper. There are eight large lights in this dome. The concrete in the dome is generally 9 inches thick throughout, reinforced with expanded steel and circumferential round steel rod rings.

"Inquirer" asks for a comparative statement of building operations at Calgary for the first quarter of 1910 and the corresponding period of 1909.

The value of the permits issued during March, 1910, was $115,800, and during March, 1909, $91,900. For the first three months of 1910 the total was $692,100, compared with $194,600 for the same period of 1909. The approximate increase per cent. for the first three months of the current year works out at 256 per cent.

Canadian City Engineers

Mr. H. B. R. Craig, Kingston, Ont.

Had Mr. H. B. R. Craig followed the profession of his father he would have been a Presbyterian minister instead of a city engineer. Whatever influences were brought to bear, however,—adverse or otherwise,—Mr. Craig decided to become an engineer; and, as far as we know he has not found occasion to regret his choice. He was born at Deseronto, Ont., 30 years ago. His early education was obtained in the Deseronto public and high schools and at the Kingston collegiate institute. Later on he attended school in Stuttgart, Germany, for a couple of years. In 1898 he joined the Royal Military College at Kingston, leaving that institution on account of ill-health in December of the following year. The next connection he made was with the School of Mines, Queen's University, Kingston, from which, in 1903, he graduated as a Bachelor of Science in Civil Engineering. In 1905 he was elected an associate member of the Canadian Society of Civil Engineers. Last year, it is of interest to note, he became a member of the American Society of Engineering-Contractors.

Mr. H. B. R. Craig, City Engineer of Kingston.

Mr. Craig has seen some useful experience. In 1901 he was associated with Mr. A. K. Kirkpatrick, city engineer of Kingston at that time, in connection with the arbitration with the Light, Heat & Power Company for the control of the electric light and gas plants of the city. The following year he was engaged in preliminary and location surveys from Deseronto to Napanee and from Tweed to Bannockburn, Ont., for the Bay of Quinte Railway. During 1903 and until May, 1904, he was resident engineer on this railway in charge of construction of a ten-mile section, including grading, ballasting and track laying.

From May to December, 1904, Mr. Craig was resident engineer on the Toronto-Sudbury branch of the C.P.R., being in charge of the revision of location and the construction of a ten-mile section from Wahnapitae river crossing to Sheppard lake. He became connected with the engineering staff of the city of Kingston in December, 1904. Here he remained until May, 1906, from which date until June, 1907, he was resident engineer on the Lake Superior Branch of the G.T.P., in charge of an 8-mile section at Buda, Ont. Later, he was resident engineer on the Prairie West Division of the same railway, having charge of construction through the Eagle Hills.

The position which Mr. Craig now occupies came to him in March, 1908, when he was appointed city engineer, building and plumbing inspector of Kingston. During Mr. Craig's tenure of office the city has carried out a number of important municipal projects. Among the works that have come under Mr. Craig's direct supervision may be mentioned the construction of 41 miles of railroad construction, 10 miles of tracklaying and ballasting, 2,000,000 feet B.M. timber trestles, one single track railroad tunnel in solid rock, including approaches 2,600 feet long; 23 miles of concrete sidewalks, 2 miles of tile sewers and 3 miles of macadam roadways.

Mr. Craig is city engineer of no mean city. A volume might be written upon the historic associations of Kingston. But we are more concerned with its development and future. In this regard we shall doubtless have plenty to relate in the future.

Personal News and Notes

At Halifax, N.S., the plumbers' strike has been settled by an increase from 25 to 30 cents an hour. Thirty-five cents an hour was asked.

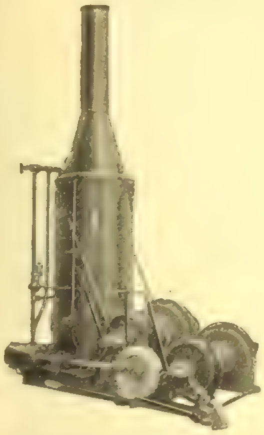
Messrs. Chipman & Powers, consulting engineers, Toronto, have been engaged by the town of Dauphin, Man., in connection with the proposed waterworks and sewerage systems there.

Messrs. Sutcliffe & Neelands, consulting engineers, New Liskeard, Ont., have been appointed town engineers for the new municipality of Cochrane, in northern Ontario. A considerable amount of work will be done at Cochrane this summer in the laying of sidewalks. A sewage disposal system will be installed next fall.

City Engineer Ruttan, of Winnipeg, attended the annual convention of the American Waterworks Association held recently in New Orleans. At the convention Mr. Ruttan read a paper on Winnipeg's high pressure fire system. This paper will be found elsewhere in this issue. So far, the only cities on the North American continent which have a system of this kind are New York, Philadelphia, Toronto and Winnipeg.

Messrs Jacobs, Davies & Forgie, of New York, have been engaged by the city of Toronto to prepare a preliminary report on the subway question, for which they will receive $5,000. City Engineer Rust estimates the cost of a subway on Yonge street, from Front street to a point 500 feet south of St. Clair avenue, at $1,400,000 per mile, or a total of $4,017,000. The equipment will cost about $300,000, and the maintenance $60,000 per year. The surface lines to be constructed in connection with the subway will cost $70,000 per mile.

Mr. N. C. Nichols, of the New York Dual Continental Filtration Company, is representing the interests of his firm at Montreal, where a new fileration system is under consideration. Messrs. Herring & Fuller, the New York engineers who are reporting on a filtration system for Montreal, state that it will be several months before they will be ready to present plans, specifications and estimates to the authorities. A testing laboratory has been erected at the city waterworks station. Investigations will be made there for the engineers by Messrs. Hinkley & Harrington.



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Contractors and Their Work

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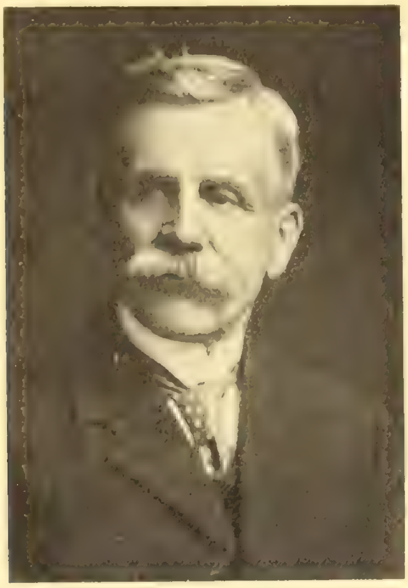
When a firm has been carrying on a successful business in a large city for upwards of 30 years, they need little introduction to the people in that particular section of the country. Nevertheless, not a few of our readers will be interested in a brief reference to Messrs. Witchall & Son, builders and contractors, Toronto. There are many important structures to attest the excellent work of this firm. Among these may be mentioned the Robert Simpson store, the Presbyterian Church at Rosedale, Knox Church, John Leckie warehouse, Ogilvie & Son's warehouse, Robert Simpson warehouse, Flett-Lowndes building and the Hydro-Electric transmission station.

Mr. C. C. Witchall, whose photo is reproduced herewith, has seen many changes in methods of construction during the last quarter of a century or so. Of these, of course, nothing is more noteworthy than the increased use of cement. Mr. Witchall states that he now uses 100 barrels of cement where formerly he used one. He looks for the cement industry to extend its ramifications still further and finds much cause for gratification in the excellent material available in Canada. The Witchall firm has entered upon another active season. Their present contracts include the new brick Bonar Presbyterian Church, the Yonge street Methodist Church and the power station for the Hydro-Electric Company.



Mr. C. C. Witchall, an "Old-Timer" in Toronto Contracting Circles.

There is an unaccountable divergence of opinion as to the scarcity of brick and other building material at Winnipeg. The Carter-Halls-Aldinger Company state: "There is plenty of building material of all kinds to be obtained and there is an abundance of labor." Mr. Bergeron, of the Tyndall Quarries Company, states: "There is a little shortage in lime and rubble stone, but this was caused by the early building season and will soon be relieved. We are considerably ahead of last year."

The plumbers at Victoria, B.C., have succeeded in obtaining an increase of wages from $4 to $4.50 per day.

Ozone Purification—Defence of

Mr. J. Howard Bridge, who represents the company which proposes the installation of an ozone purification process for Ottawa, discounts the unfavorable statements made by the Ontario Board of Health on the ozonization process as in operation at Lindsay, Ont. This test was only finished a few months ago and has not yet been made public, but Dr. Sheard, Toronto, has given out that it will be of an unfavorable character. Mr Bridge states that he was refused information as to the methods employed in testing his process, but has since learned that raw air was admitted into the sterilizing wells of the plant when the test was being made. This, he says, greatly impaired the efficiency of the plant. He further states that Dr. Sheard wrote to Dr. Vaughan, a well known bacteriologist, and dean of the medical college of Ann Arbor, Mich., asking his opinion on ozonization. There is a large plant at Ann Arbor, which was tested by Dr. Vaughan, who has reported that the water was of exceptional purity and that the bacteria in raw water number 9,600 disease-producing germs, as compared with less than 50 non-disease-producing germs in the ozonized water.

Mr. Bridge is just back from Ogdensburg, where his company is putting in a small demonstrating plant. Mr. Allan Hazen, the New York expert, who was in Ottawa last week, told the city council of Ogdensburg that the water of the Oswegatchie river there could not be purified for less than $175,000, and he submitted a plan for the same. Mr. Bridge, however, states that he has offered to do it for $75,000, and at one-half the operating cost of the other scheme, which was a slow sand filtration one.

Mr. Bridge states that during the last 18 months Paris, Madrid and St. Petersburg have adopted his process.

The Weight of Cement

A correspondent asks: "Does one cubic foot of your cement weigh 100 pounds or more? When I mix it with sand and stone, can I take one sack for a cubic foot or should I measure it out?"

The weight of any cement is governed very largely by the manner in which the weight is determined and, therefore, the test of the weight is an uncertain one and one which is seldom used. Everything else being equal, a finely ground cement will weigh less than a coarser one, first, because any material in the mass form weighs more than the same material broken up into small particles, owing to the fact that it is physically impossible for the particles to pack as closely as they were in the original mass. Second, the particles of cement when reduced to a fine powder, have a tendency to entrap air when entering a receptacle and the air is not entirely eliminated until the material has remained undisturbed for some time. For example, the height of a load in a car changes materially between the mill and destination of the shipment. The height of a pile of cement in a warehouse reduced rapidly the first few days in storage.

Cement to be used should never be removed before the quantity should be determined by weight. For convenience it is recommended that one sack of cement containing 94 pounds net be taken as one cubic foot.

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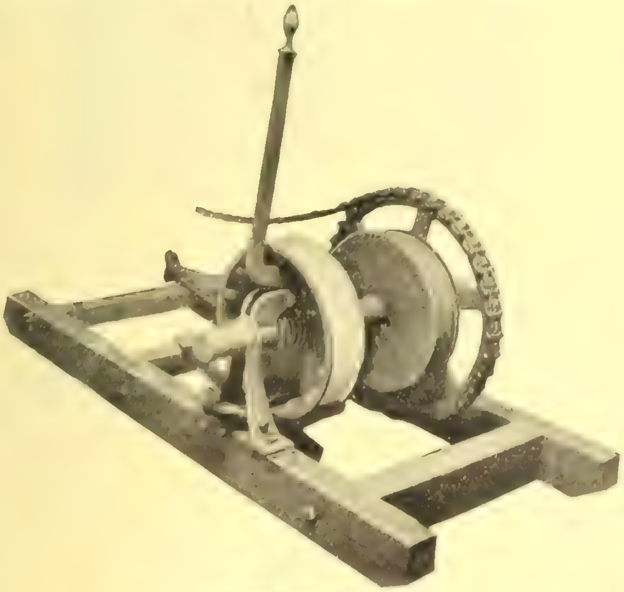

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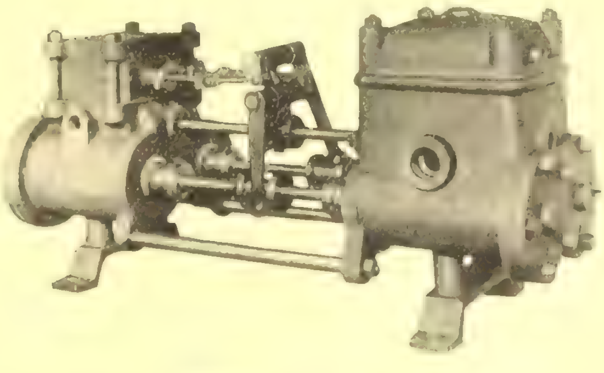

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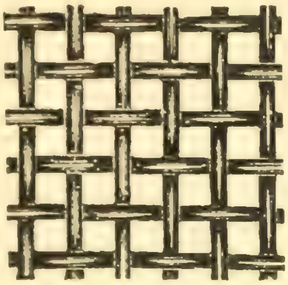

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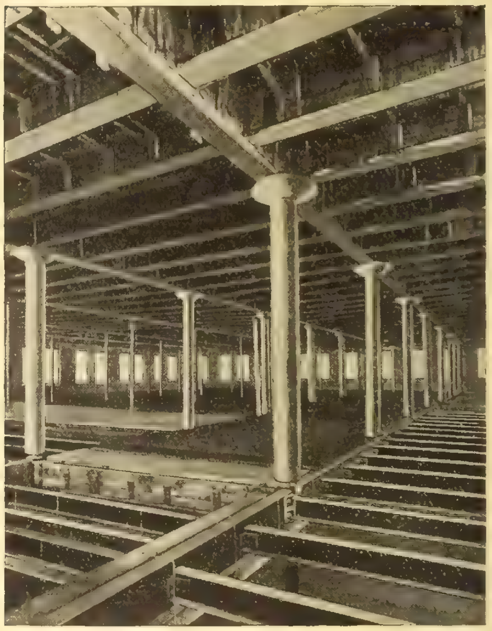

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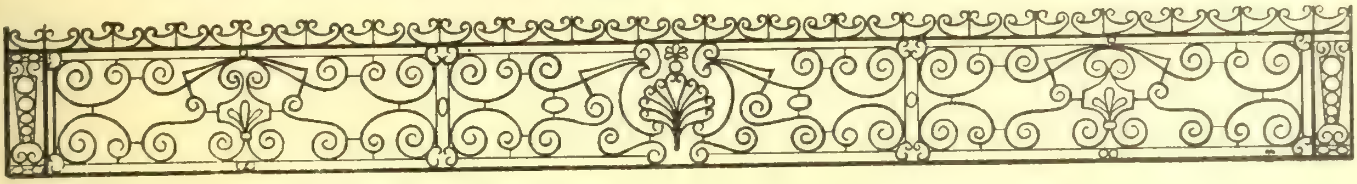

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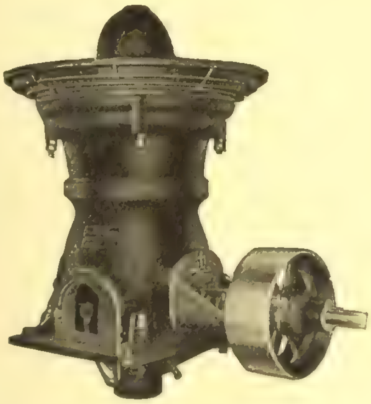

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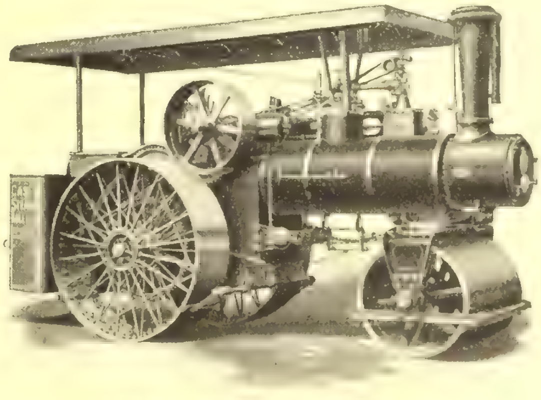

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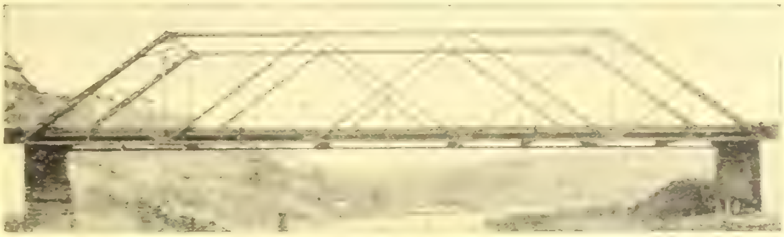

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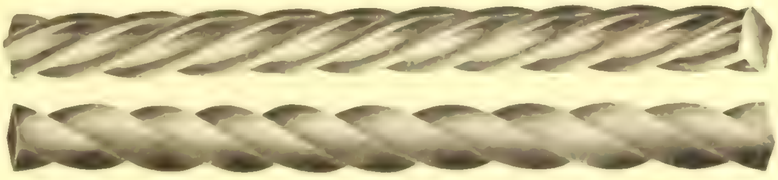

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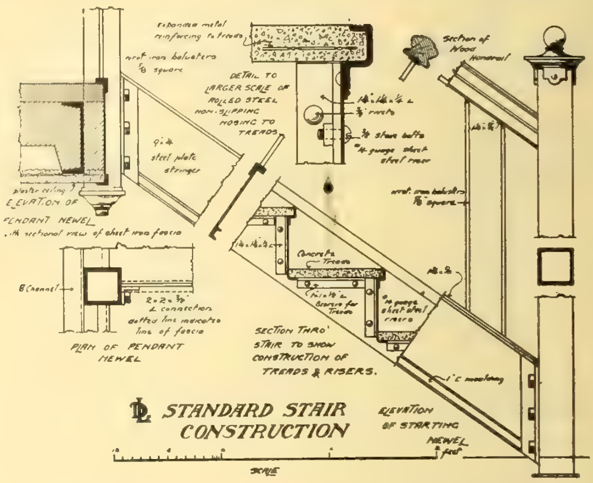
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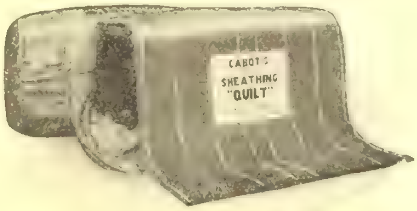

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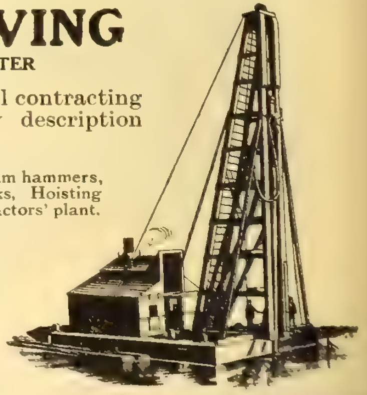

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	Per M.
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		Star.	D,D.
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26 to 40	“	4.65	6.75
41 to 50	“	5.10	7.50
51 to 60	“	5.35	8.50
61 to 70	“	5.75	9.75
71 to 80	“	6.25	11.00
81 to 85	“	7.00	12.50
86 to 90	“	....	15.00
91 to 95	“	....	17,50
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96 to 100	“	....	20.50
101 to 105	“	....	24.00
106 to 110	“	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.......	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.......	4.25	3.75	7,25	5.50
50 u. i.......	4.75	4.25	8.75	6.50
60 u. i,......	5.00	4.75	10.00	7.50
70 u. i.......	5.25	5.25	11.50	8.50
80 u. i.......	5.75	6.00	12.50	9.50
85 u. i.......	....	....	14,00	10.50
90 u. i.......	....	....	16.50	11.50
95 u. i.......	.,..	....	18.00	13.50
100 u. i.......	....	....	20.00	16.00

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30-gallon, standard, $4,50; extra heavy, $7.00.

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16 x 24, $1.00; 18 x 30, $1 15; 18 x 36, $1 95.

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⅜ inch	2.25	⅜ inch......	3.08
½ inch	2.63	½ inch......	3.48
¾ inch	3.28	¾ inch......	4.43
1 inch	4.70	1 inch......	6.35
1¼ inch	6.41	1¼ inch......	8.66
1½ inch	7.70	1½ inch......	10.40
2 inch	10.26	2 inch......	13.86
2½ inch	16.39	2½ inch......	22.14
3 inch	21.52	3 inch......	29.07
3½ inch	27.08	3½ inch......	36.58
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Crushed stone, $1.25 per ton, f.o.b. Toronto,
Binder stone, $1.25 per ton, f.o.b. Toronto.
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Brown coursing stone, delivered, $3.25 to $3,50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per thousand.
Steel channels and beams, $2.75 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents,
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Manilla Rope, best, per pound, 15 cents.
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Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs,
Boiled Linseed Oil, in barrels, $1.00 per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 97 cents per gallon of 9 lbs.
Turpentine, in barrels, 81 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Smith & McKenzie, hardware merchants, have dissolved.

Queen City Planing Mill, Toronto, Ont., has been burned out.

Shurley & Dietrich, Galt, Ont., manufacturers of saws, have idssolved.

The Changeable Electric Sign Company, Montreal, Que., have dissolved.

M. McIntyre, lumber merchant, Phoenix, B.C., has sold out to C. A. Ross.

Faraday Electric Company, Vancouver, B.C., have assigned to W. J. Wilson.

J. R. Campbell, Kelowna, B.C., dealer in electrical supplies has sold his business to James Bros.

The Ball Planing Mill Company, Barrie, Ont., has been organized into a joint stock company, limited with the following officers: President, J D. Rodgers; vice-president, Wm. Gallie; secretary-treasurer, Claude Faux.

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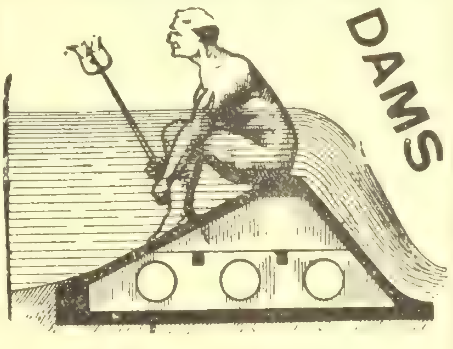

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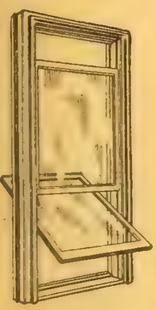

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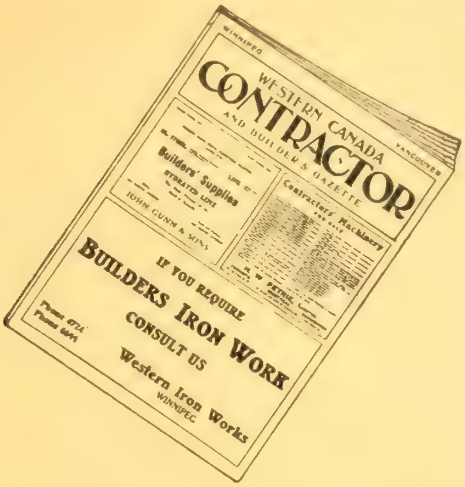

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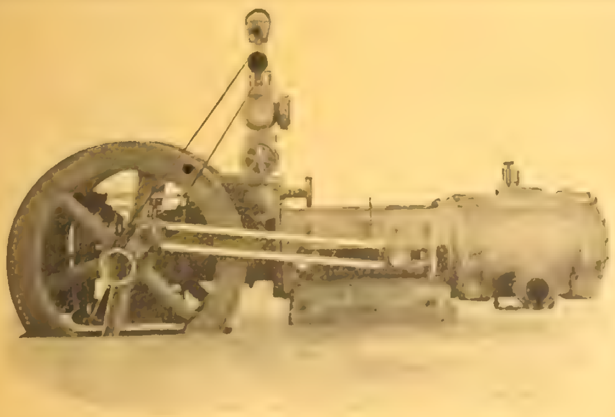

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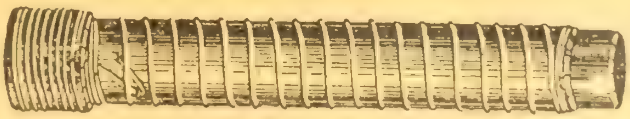

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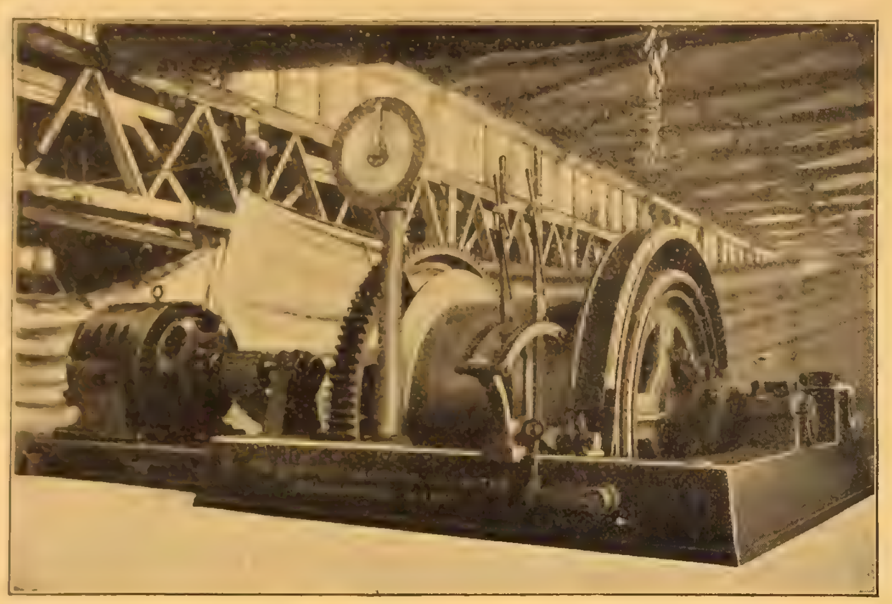

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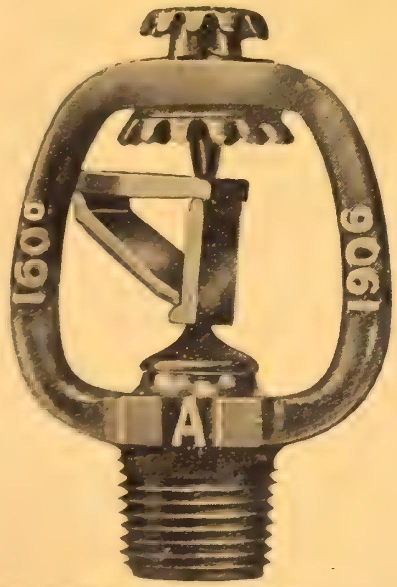

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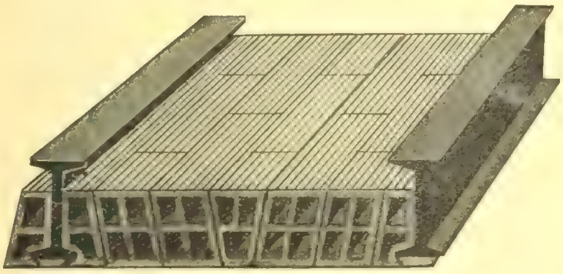

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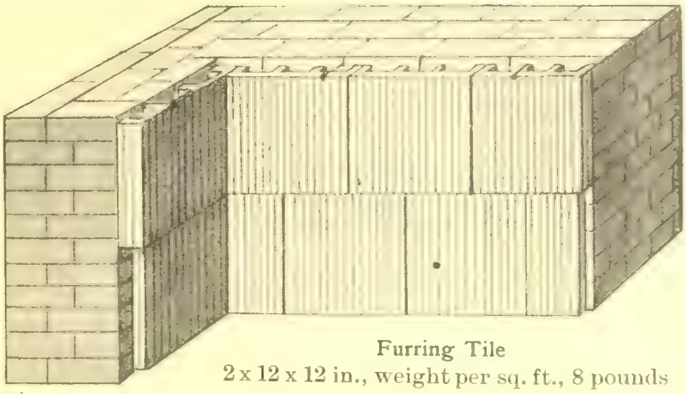

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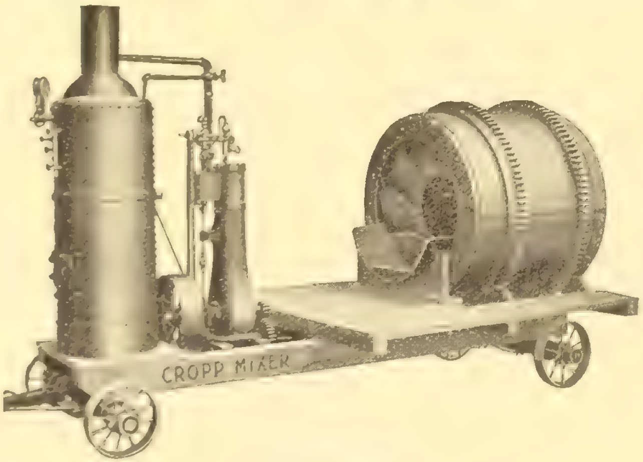

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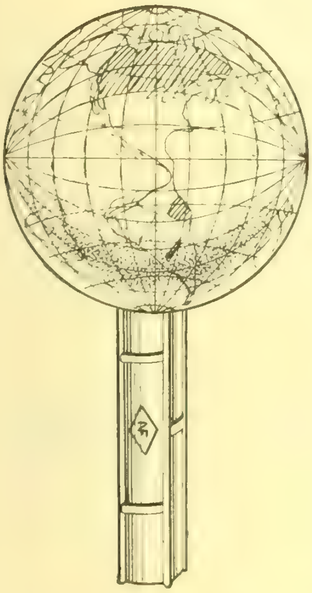

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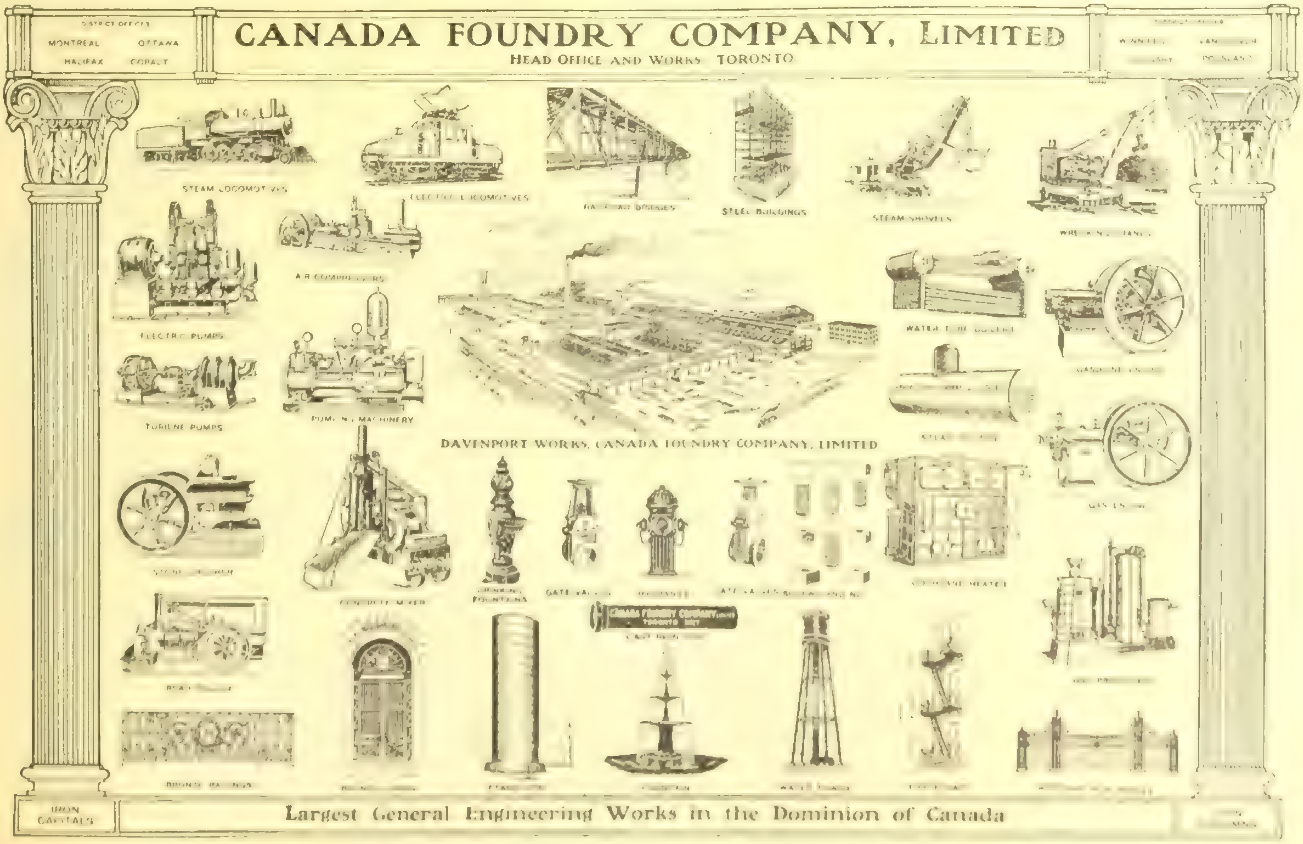

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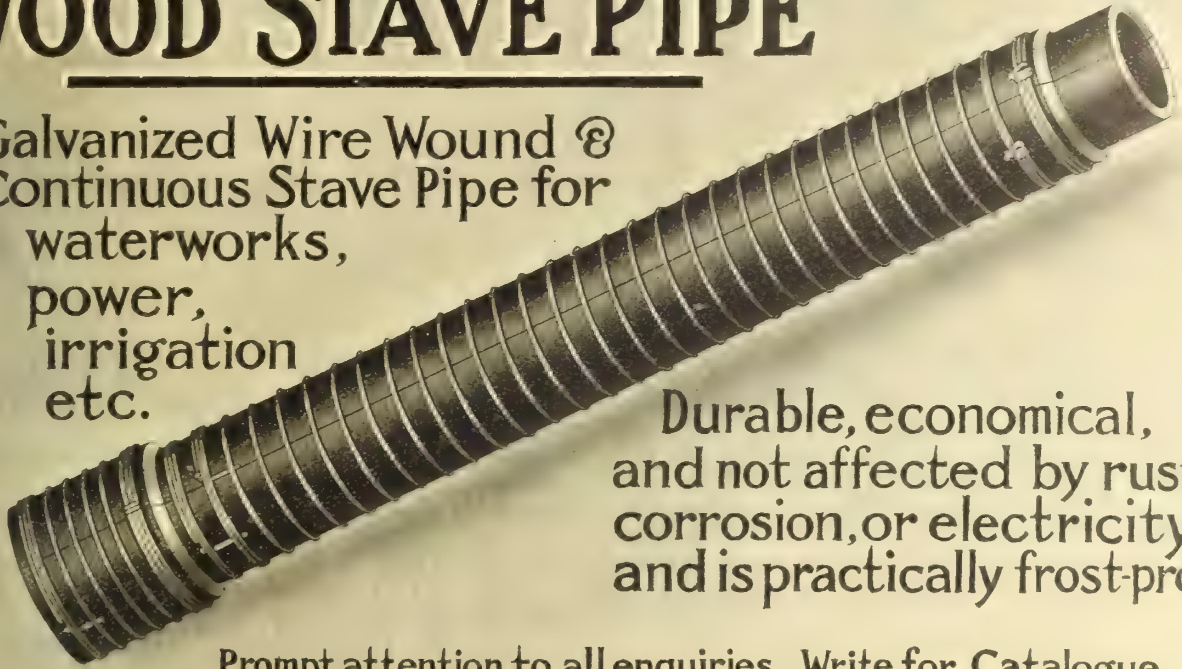
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Brantford "Automatic" Batch Concrete Mixer

WATER
IDEAL AUTOMATIC BATCH CONCRETE MIXER
GOOLD SHAPLEY & MUIR CO. LIMITED BRANTFORD CANADA

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

If interested send for Catalogues.

Goold, Shapley &
Muir Company,
Limited
Brantford, - Canada

HENRY NEW ROBERT W. NEW

Hamilton Pressed Brick

Hamilton Pressed Brick used in this Building

The highest standard of quality and color, for which this brick is noted, never varies.

This Brand gives a finish and refinement to a house that no other will.

Connection with all railways right from our kilns.

Hamilton Pressed Brick Company

Phone Long Distance 345 and 2931 Head Office: Spectator Bldg., **Hamilton, Ont.**

When You Want Good Sewer Pipe

Don't forget that there is one place where you will be sure of the **best** article and the very best treatment.

Drop a line to

THE ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
"MIMICO" Pipe Makes the Sewer Sure

Why Shingle a House when Brantford Roofing is better?

Many builders and contractors, who have made a close study and inspection of the different classes of roofing materials on the market, recommend Brantford Roofing for use on dwelling houses as well as on factories and stores.

They do so, because Brantford Roofing makes a neat and attractive appearance on the roof;

Because Brantford Roofing makes a perfectly watertight roof;

Because Brantford Roofing will not melt in summer or turn brittle and crack in winter;

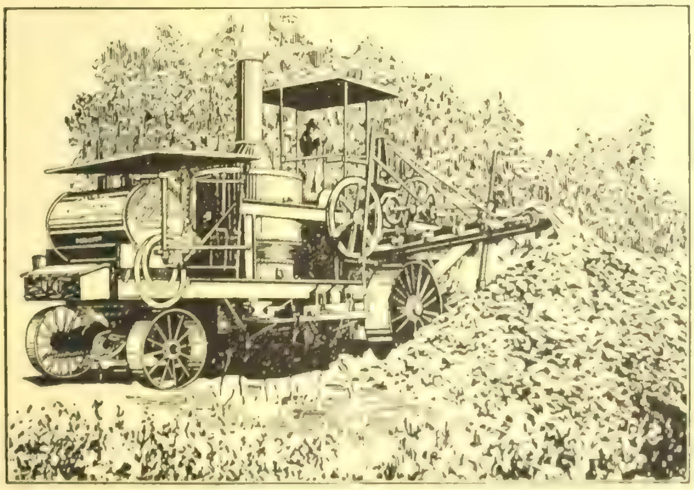
Because Brantford Roofing is fire-resistant;

Because Brantford Roofing is more than TWICE as durable as wooden shingles, yet costs no more.

Send for our big roofing booklet. It gives valuable facts about roofing materials. Also ask us for samples of Brantford Roofing.

Brantford Roofing Company, Limited
Brantford, Canada

Time Consumed in Selecting a Trench Excavating Machine is not Time Lost



Trench Excavation is about the most severe and exacting work to which a Machine Excavator can be put.

The up-to-date Contractor wants to select a Machine which will possess qualities on which he can absolutely rely when figuring on a contract.

The Machine must be dependable, durable and profitable.

The Machine must be able to excavate in any kind of earth, so the Contractor will not have to choose the kind of earth for the Machine.

Our Trench Excavator being beyond the stage of experiments, possesses all the above qualities.

Our Trench Excavator will dig a trench 27 in. to 60 in. wide, and any depth down to 20 ft.

Mr. Contractor, if this is the Machine you want for your work, we are at your command.

J. W. Harris Mfg. Company, Ltd.
MONTREAL

Best for all Re-inforcement Work

Floors, Columns, Roofs, Bridges, Dams, Sewers

THE "BEATH" SYSTEM

Triangle Mesh Concrete Reinforcement

The many advantages of Triangle Mesh Reinforcements are being universally appreciated by the leading Engineers, Architects and Contractors. Our two books—"Engineers' Handbook" and "Some Users of Triangle Mesh and their Structures"—should be in the hands of every one interested in reinforced concrete construction.

Besides giving all information regarding Triangular Mesh Reinforcement and its application, these books contain much valuable information regarding reinforced concrete construction in general and tables of weights, areas, bending moments, etc., which have been compiled from reliable authorities. We will send you these books. Write for them to-day. Their acceptance implies not the slighest obligation.

If you have any reinforced concrete work in hand let us have your specifications covering area of reinforced concrete, spans, and loads, and we will submit you prices that will surprise you.

The "WHY" of the "BEATH" System

Continuous bond reinforcement.
Lapping and tying unnecessary.
Perfect stress distribution.
A most perfect mechanical bond.
Easily handled.
Conveniently stored.
Minimum cost of installation.

200 different styles, weights and cross section areas.

Used in Canada and States with unqualified success on largest construction work made of cold drawn mild steel.

Costs 30% to 40% less than any other reinforcing fabric on the market.

We point with pride and refer you to the following users:—

Joseph Vincent, Union, Ont.
Robert Simpson Co., Ltd., Toronto.
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Septic Tanks, St. Thomas, Ont.
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Transformer Stations at Toronto, Dundas, Niagara Falls, St. Thomas, London, Woodstock, Paris, Preston, St. Marys, Stratford, Guelph and Berlin.
Winch Bldg., Vancouver, B.C.
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Large stocks carried for immediate shipment. Write to-day. Enquiry will not obligate you.

W. D. Beath & Son, Limited

Toronto - Canada

Every

Luxfer - Prism

is designed to meet a condition and meets it every time

Every architect or contractor who has a lighting problem to solve should recommend **"Luxfer-Prisms"** every time. First expense is last expense except the occasional application of soap and water. When our wrought iron frames are used the side-walks will not warp or sag as with the old system of cast iron frames.

Luxfer-Prism Company, Limited

100 King Street West, TORONTO

Here is the PRACTICAL Culvert!

FREE sample and booklet illustrates this Sectional Culvert, made of best Billet Iron, heavily **Galvanized** and deeply **Corrugated.** Strongest, simplest and most **Practical** culvert for any purpose. Excels cement and costs less because lasts longer and stands far more strains.

PEDLAR

NESTABLE GALVANIZED

CULVERT

Skilled Labor Needless
Simple and Easy to Lay
Easiest Transported
Most Durable
Endorsed by Railways and Road Officers

The pictures here suggest how easily Pedlar Culvert can be laid. Shipped in nested half-sections, saving freight and cartage. **Only Culvert that you can break joints on**. Triple-thick, flat flange lock-rib adds vastly to its strength. Heavy-gauge Billet Iron, best quality, curved cold and then corrugated. Thick galvanizing makes whole surface absolutely corrosion proof. Absolutely unrivelled for **every** culvert purpose.

All sizes from 8 ins. to 6 feet

Let the **Free Sample** and Booklet No. 67 inform you on the economy and practical merit of the Pedlar Perfect Culvert. Needs no bolts; no rivets; no compression keys—simply clamp the lock-ribs one into another. Leak-proof and decay proof. **Investigate** and get prices. Address warehouse nearest you.

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OTTAWA 423 Sussex St
TORONTO 111-113 Bay St
CHATHAM 200 King St. W.
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CALGARY 1112 First St. W
VICTORIA 434 Kingston St
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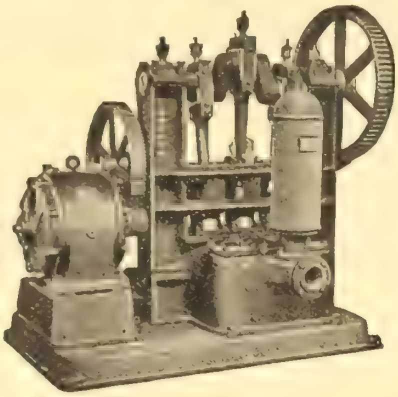
Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY



Goulds Pump Co.

Coristine Building, **Montreal**
Phone Main 1054
Works: Seneca Falls, N.Y.

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"The Best Paving Block Made"

Daily Capacity 500,000

Every time **"Metropolitan Block"** are adopted it is the initial proceeding for a permanent pavement.

The Metropolitan Paving Brick Co.
Canton, Ohio, U.S.A.

You'll Never Regret It

This is the busy season for architects and contractors, preparing plans and specifications for Spring operations, be sure you recommend

Port Credit Brick

It's the make that lasts the longest, looks the best

Port Credit Brick Co.
Limited
Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

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The Dry Pressed Brick is the most artistic up-to-date permanent building material on the market. Architects and Contractors agree on this. We are manufacturing best colored, most uniform Brick on the market.

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Fine Interior and Exterior Woodwork

including Bar, Office, Bank and Church Fixtures, Mantles, Grills, etc. :: ::

Among our lines are high-class Hardwood Flooring, Sashes, Doors, etc. Be sure to get our prices on these goods. :: ::

We make everything in Church Furniture.

Blonde Lumber & Mfg. Co.
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You Cannot Afford

to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.
The standard of excellence is marketed in

"Hammer Brand" Hard Wall Plaster

HARD-WALL PLASTER HAMMER TRADE MARK BRAND HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Inter-phones

are savers of lost motion—abolish the thousand and one steps taken needlessly every day. Inter-Phones tug at the beard of old Father Time—hold him—make every hour of the day more productive;—leave more minutes for work. Would you do without a 'phone in your house—or your office? Then, hadn't you better connect your departments in the same way?

Inter-Phones cost little to install and operate at a low maintenance charge. The time they save will pay for the installation over and over. The question is not "Can I afford to put them in?" Your problem is "Can I afford to be without Inter-Phones?" Figure it out and answer it for yourself. Booklet No. 413, free on request, tells the fullest particulars.—Send for it.

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Manufacturers and Suppliers of all apparatus and equipment used in the construction, operation and maintenance of Telephone and Power Plants. Address our nearest office.

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SCIENTIFIC ILLUMINATION

Proper reflection, Distribution and Diffusion are most important features to be considered in correct illumination.

Send us your blue prints and we will be pleased to submit lighting recommendations for all classes of buildings.

Our Illuminating Engineering Department is at the service of Canadian Architects, Consulting Engineers, and Electrical Contractors.

Nothing too large or too small.

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The Municipal Construction Co.
Limited

Contractors for
Waterworks Construction

MANUFACTURERS OF

Wire-Wound Stave Pipe
Continuous Stave Pipe

Agents for Waterworks Supplies

P. O. Box 40 - Vancouver, B. C.

CRUSHED
All Sizes
STONE

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

Roman Stone
(Trade Mark Registered)

is the best

BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
100 Marlborough Ave.,
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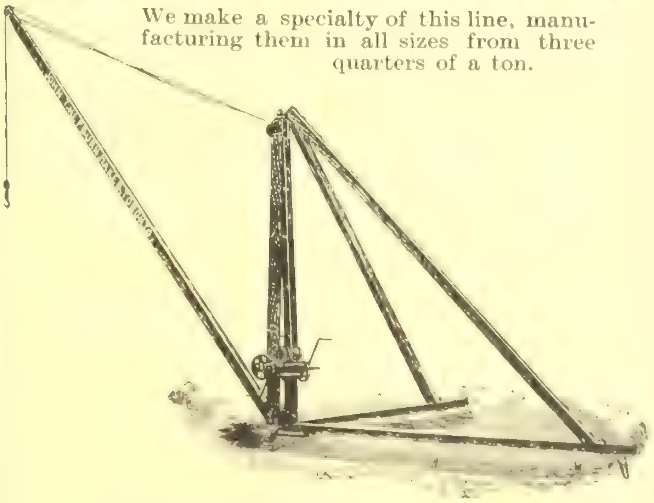
T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds
Prices on application

JOHN T. HEPBURN
18-34 Van Horne St., Toronto, Canada

High
Grade
Fire
Brick

For
Cupola Linings
Blast Furnaces
Boiler Settings,
etc.

Cupola Block and Standard 9 in. shapes Carried in stock.

Ask for Catalog.

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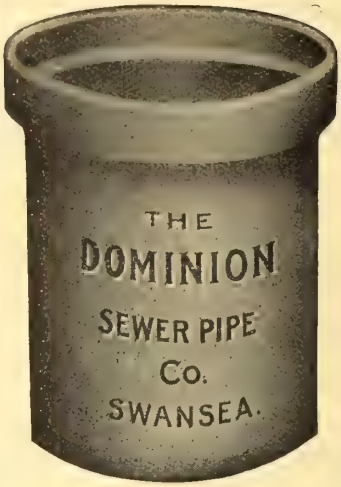
TORONTO, CANADA
Canadian Branch of the Robinson Clay Product Co., Akron, O.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

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Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

Telephone (Toronto Connection)
Park 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Sewer and Culvert Pipes

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

American Sewer Pipe Co.
Akron, Ohio, U.S.A.

Largest Manufacturers of
Glazed Earthenware
in the world.

Sewer Pipe
Single and Double. Strength, 3" to 36"

Clay Conduits Single and Multiple

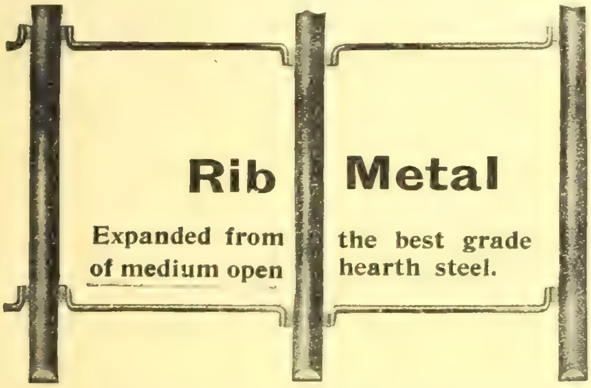
Samples furnished on request.

WE INVITE COMPARISON

KAHN SYSTEM

of Reinforced Concrete

Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.



Rib Metal

Expanded from of medium open the best grade hearth steel.

For reinforcing floors, roofs, etc.
Efficient. Easily handled.

Trussed Concrete Steel Co.

of Canada, Limited

Head Office:	Branches:	Agencies:
Walkerville	Toronto, Winnipeg, Montreal, Vancouver,	Quebec, Halifax.

J. H. New, President   Ryland H. New, Vice-President

A Success from the Start

Established 1860
Large Flanges

Not necessary to chip **HAMILTON PIPE** in making connections.

Hamilton Sewer Pipe

For the past 50 years has proven a complete success. Many of Canada's leading engineers and progressive contractors prefer our product simply because they know by experience that our pipe will give them a satisfactory job.

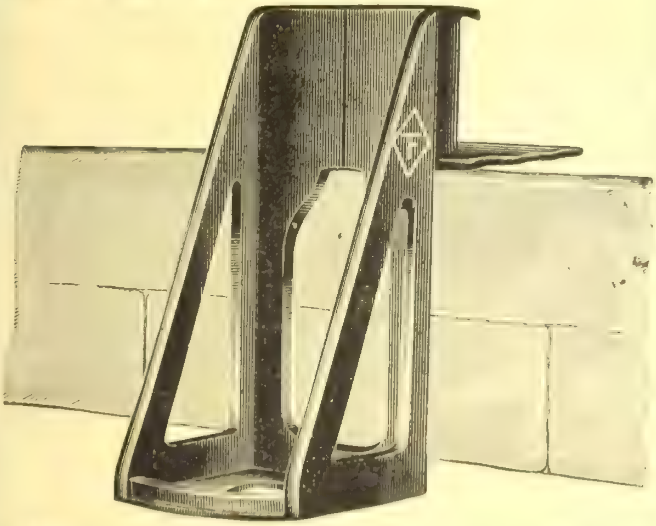
The Pipe that has
Proven
Positively
Perfect

The Hamilton and Toronto Sewer Pipe Company, Limited

Hamilton and Toronto

Builders' Joist Hangers

ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE

Estimates Furnished

TAYLOR-FORBES COMPANY, Limited
GUELPH, ONTARIO

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited

Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO

Any structural material which owing to the process used in manufacturing it cannot be made except from perfect material, should command your entire confidence.

Perfection Wire Mesh

(Canadian Made)

for Concrete Reinforcement is of this nature. The wire used in it is cold drawn and thus most searchingly tested.

CLARENCE W. NOBLE
117 HOME LIFE BUILDING - TORONTO, ONT.

Pine Doors

We have long appreciated the fact that price is not the only requisite an architect, builder or contractor must seek in placing his order for doors. Poorly manufactured doors can scarcely be considered a bargain at any price.

Door Making is our Specialty

We have equipped our plant with the best door machinery made, and turn out doors that are right in quality and right in price.

Our doors need no commendation. They prove themselves.

Prompt deliveries. Write for prices.

Wholesale or retail dealers in lumber, doors and trim.

L. A. DeLaplante, Limited
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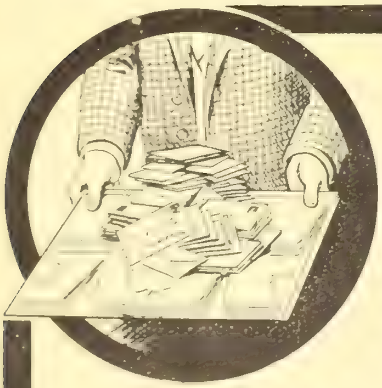

Metal Shingle and Siding Company, Limited

Preston, Ont.

Branch Office and Factory:
Montreal, Que.

The mails are bringing us record-breaking orders for

PRESTON SAFE-LOCK SHINGLES

We wish to thank the builders and contractors for the many orders they are giving for PRESTON Safe-Lock Steel Shingles. We are glad that the superior merits of PRESTON Shingles are recognized by the building trade.

We have done everything in our power to make PRESTON Safe-Lock Steel Shingles the top-notch roofing material. They are made and galvanized according to British Government specifications. They are safe-locked on all FOUR sides. They are unaffected by strains due to shrinking of sheeting or settling of building. Completely proof against rain, snow, wind, fire and lightning.

A booklet explaining their superior construction will be mailed free on request.

Fertile Ground

The most profitable space to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Automatic Batch Concrete Mixers No. 1

Made in two sizes
No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save You Money { **On the first cost of machine**
On cost of operation
On cost of mixing concrete

OUR AUTOMATIC MIXERS do **perfect measuring** and **mixing** with **any kind of material, measure any proportion,** and give **any consistency of moisture.** Materials only handled once. **Less men required to operate.** Send for catalogue and state capacity desired.

We also manufacture a STANDARD DRUM BATCH MIXER in three sizes, one-third yard, one-half yard and one yard. The most complete Drum Mixer out. We have everything in the line of Concrete Machinery and Cement Working Tools. Tell us your requirements.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:
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Agent for Nova Scotia:
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Agent for B. C.:
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Agents for Montreal: Lemarre Bros., 323 Hibernia Road, Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

"Empire Brand"

ensures a perfectly smooth hardwood floor which will be "a thing of beauty and a joy forever." If you want your clients to speak of you as "a fellow who always uses the best materials obtainable," specify

"Empire" Brand

every time.

J. R. Eaton & Sons

Orillia, Ontario

Montreal Agent: THE HARDWOOD FLOORING CO., 55 St. Francois Xavier Street

"Inglis" Corliss Engines

are known above all others as being pre-eminently "Engines of Quality," Economical, Durable and Reliable and can be depended upon to give the same good results twenty years from now.

We build them Single, Tandem, Compound and Triple, for heavy or light duty. Remember our thirty-five year reputation is back of every "INGLIS" engine. Specifications and prices upon request.

The John Inglis Company
ENGINEERS AND BOILERMAKERS Limited
14 Strachan Avenue - - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Claresholm, Alta.

The $15,000 waterworks bylaw was carried.

Coldwater, Ont.

The citizens authorize the expenditure of $23,000 for the installation of a gravity system of waterworks.

Fernie, B.C.

Tenders were called until the 3rd inst. for construction of a system of sewers and extension to the waterworks system. Plans, etc., with city engineer. G. H. Boulton, city clerk.

Guelph, Ont.

Tenders will be received until June 10th for approximately 11,700 square yards of bituminous pavements. James Hutcheson, city engineer. See advertisement in "Tenders and For Sale Department" of this issue.

Glasgow, N.S.

Engineer Mitchell has completed the survey in connection with the proposed waterworks.

Hamilton, Ont.

Tenders addressed to J. I. McLaren, chairman Board of Control, will be received until June 2nd for the construction of sewage disposal works pump house. Plans, etc., at office of City Engineer Macallum. S. H. Kent, City Clerk.

Edmonton, Alta.

Alexander Potter, C.E., of New York, has been engaged to prepare a report on the problem of sewage disposal in Strathcona and this city.

Esquimalt, B.C.

The necessity for a sewerage system is felt. Amount required, estimated at about $50,000. Dr. C. J. Fagain, provincial health officer.

Montreal, Que.

Tenders will be received by the City Clerk until Thursday, June 9th, 1910, for the construction of a sewer on Labelle street between Morin street and Garry street, to St. Hubert street sewer. John R. Barlow, City Surveyor.

Tenders addressed to L. O. David, city clerk, will be received until June 2nd for the supply of about 4,000 tons of c. i. pipes. Specifications at office of the Superintendent of Water Works.

New Westminster, B.C.

Tenders are required for the laying and jointing of about 14 miles of 25-inch rivetted steel watermain and about 7,780 feet of 12-inch and 7,500 feet of 13-inch lap welded pipe. Plans, etc., obtained from the city engineer by the 6th of June. W. A. Duncan, city clerk.

North Bay, Ont.

Council has passed a bylaw to issue $65,835 debentures for the sewerage system.

North Toronto, Ont.

The following tenders for 7,000 feet concrete sidewalk were received: Forcott Construction Company, 13½ cents a square foot; Royal Artificial Stone Company, of Guelph, 14 cents a square foot (accepted); J. Thompson, Toronto, 16½ cents a square foot.

Oshawa, Ont.

Tenders will be received until June 13th for the construction of 5,500 lineal feet, etc., of cement concrete sidewalks. F. Chappell, town engineer. See advertisement in "Tenders and For Sale Department" of this issue.

Port Hope, Ont.

Tenders are being called until June 13th for construction of five miles of concrete sidewalks, etc. See advertisment in "Tenders and For Sale Department" of this issue.

Petrolia, Ont.

J. McHattie, town clerk, is calling for prices on street pavement until June 6th. See advertisement in "Tenders and For Sale Department" of this issue.

Peterborough, Ont.

The bylaw to authorize the expenditure of $30,000 for sewage facilities in the southwestern portion of the city was carried.

Point Grey, B.C.

The council are considering projects for an appropriation of something like $500,000 to cover the cost of reservoir and site and the laying of mains. A bylaw for $250,000 will also be introduced for sewage works.

Rosthern, Sask.

The town council is calling for tenders for thirty yards of clean gravel and twenty barrels of cement.

Renfrew, Ont.

Tenders addressed to N. McCormack, M.C., chairman, Waterworks Committee, will be received until June 11th for 2,500 barrels Portland cement.

St. John, N.B.

Tenders were called until June 1st for supplies for the Water and Sewerage Department. Specifications at office of City Engineer W. Murdoch.

A $11,000 water mains bylaw will be submitted to the ratepayers.

St. Thomas, Ont.

Tenders addressed to Jas. A. Bell, city engineer, will be received until June 3rd for building a reinforced concrete culvert over Mill Creek on Palm street; also for grading, boulevarding and macadamizing Myrtle street from Fifth avenue to Third avenue. Plans, etc., at office of the above.

Stewart, B.C.

A deputation headed by Mr. H. Smith waited upon the government to request a grant of $30,000 for sewage and sidewalk construction. J. Fred Ritchie, government engineer.

Toronto, Ont.

Tenders are being called for additions and alterations to engine-house at main pumping station, until June 14th. G. R. Geary, chairman, Board of Control.

The Board of Control have decided to get plans for the 2000-foot extension of intake pipe. G. H. Benzenberg, of Milwaukee, and E. H. Keating, former city engineer, will be asked to report.

The tenders for heavy asphalt pavement for College street from Manning avenue to Dovercourt road from Construction & Paving Company for $27,000, and that for asphalt block pavement from the Asphalt Block Paving Company for $42,000, were referred to the City Engineer. Both carry a guarantee for 10 years.

Vancouver, B.C.

City Council have authorized the regrading and block paving of Pender street east, estimated to cost $105,735, and the block paving of Granville street south, to cost $741,030.

Granitoid pavement for Davie street having been decided upon, tenders will be called shortly. Estimated cost, $110,000.

The council will probably submit a bylaw to raise $500,000 to provide for a complete sewerage system.

Victoria, B.C.

City Engineer Smith in his report, submitted to City Council, outlines an expenditure of $669,910 on pavement work.

Welland, Ont.

On June 27th the ratepayers will vote on the following bylaws: To raise $60,000 for waterworks extension; $5,000 for fire alarm system; $10,000 for east end sewer.

The adopted report of Wm. Kennedy, consulting engineer, referred to in last issue contains the following suggested changes: A new 3,000,000 gallon per day pumping unit, estimated to cost $11,500; two new water-wheels, $2,300; 2,900 feet of 14-inch pumping main, stop-valves and special castings, $7,100; flexible pipe, $2,000; 2,300 feet of 20-inch pure water pipe (wood), $10,700. The report neither provides for a settling basin nor a purification plant, which will be dealt with later.

Woodstock, Ont.

Tenders will be received until June 6th for $50,000 5 per cent. road improvement debentures for County of Oxford. N. E. Birtch, County Clerk, Woodstock, Ont.....

AWARDED.

Alexandria, Ont.

T. A. Morrison & Company, Montreal, have been awarded the contract to supply one Waters' steam road roller and one Champion stone crusher.

Humber Bay, Ont.

The contract for the 4-foot sidewalk between the city limits and Mimico Creek was awarded to W. Buckhurst, the lowest tenderer, of Toronto, at 10 cents per square foot, and 12 cents for crossings. The highest tenders were 10½ cents a foot and 20 cents for crossings.

Montreal, Que.

The Board of Control have recently awarded the following contracts: Supplying of asphalt, Barber Asphalt Company;

supplying [illegible], [illegible], Leach & Company, supplying and laying curbstones, J. [illegible], supplying and laying of blue stone flags, F. J. Lawrence, supply material for asphalt sidewalks, Sicily Asphalt Company, [illegible] yards, Bitulithic Paving, [illegible] yards, supplying cement for walks, [illegible] Paving Company, supplying asphalt blocks, [illegible] Gravel, laying asphalt on streets, Warren, Quinlan Asphalt Company; supplying granite blocks, Sicily Asphalt Company, scoria blocks, F. J. Lawrence.

North Vancouver, B.C.

The tender of the Canadian Wood Pipe Company, for supplying 17,000 feet of wood pipe to the city was accepted at [illegible].

Ottawa, Ont.

[illegible] Lett, secretary, writes that the Board of Control received the following tenders: Bank Street pavement — City Engineer, $7,809; Ottawa Construction Company, $8,249; The Barber Asphalt Paving Company, $8,590; Union Construction Company, Ottawa, $8,700. O'Connor Street pavement — City Engineer, $14,734; Ottawa Construction Company, $16,050; The Barber Asphalt Paving Company, $16,424; Union Construction Company, Ottawa, $16,990. The tender of the City Engineer in both cases was accepted, subject to approval of council.

Quebec, Que.

Two tenders were received for c. i. pipes and valves from Messrs. L. H. Gaudry & Company, and Bosse & Banks, while for pipes only the following tendered: J. T. Farmer, Montreal, and the Staveley Coal & Iron Company, Limited, of Montreal. As for both Messrs. Gaudry & Company were the lowest, they were awarded the contract.

St. Catharines, Ont.

The contract for sewers was awarded to Thos. Riley for different streets as follows: $764.50, $670.00, $478.00, $1007.50, $810.00, $875.00; the city engineer's estimates on same were as follows: $741.00, $621.00, $780.00, $1040.20, $780.00, $875.00. The award for the construction of sewer on Ottawa street was postponed. The following are the prices of Newman Bros. for same streets: $845.00, $699.20, $540.00, $1050.40, $840.00, $900.00; and those of Elliott & Riley for same, $839.00, $807.00, $586.00, $1035.20, $870.00, $935.00.

Toronto, Ont.

The Allis-Chalmers-Bullock, Limited, of Montreal, was awarded by the Board of Control the contract for the centrifugal pumps and electric motors for the Sunnyside sewage system, at $3,215. The Canadian Buffalo Forge Company tendered for $3,000, bidding on 20 horse power motors, whereas the specification clearly provides for 40 horse power.

Virden, Man.

J. F. C. Menlove, secretary-treasurer, writes that the following were the successful tenderers for the cement works, etc., for this municipality: Western Pavers, Limited, Winnipeg, for construction of sidewalks; Manitoba Hardware & Lumber Company, Virden, for 800 barrels Portland cement; W. A. Cook, Virden, for the necessary supply of gravel and sand.

Victoria, B.C.

Messrs. Hutcheson Bros. & Company, Limited, have secured the contract for the supply and erection of a Volute sewage pump, electric motor and an automatic starter, at $885 each.

The Department of Public Works has awarded the contract for the permanent paving of the drives on Parliament Square to the Hassam Pavement Company at $20,000. Work is to be completed by September 30th.

Victoriaville, Que.

The contract for the supply of a road roller for this municipality has been awarded to T. A. Morrison & Company, Montreal, who will supply a Waters' steam roller.

Vancouver, B.C.

The award of the Georgia street bitulithic paving contract was made to the Warren Company.

Winnipeg, Man.

M. Peterson writes that the contract for construction of asphalt pavements in this city has been awarded to J. W. Astley, Engineer of Construction.

Westmount, Que.

The Corporation of Westmount have awarded contracts for pavement and roadway construction as follows: Paving Sherbrooke Street from Green avenue to the western limits of the city, to the Warren-Quinlan Company at $85,776; paving Metcalf avenue, Selby street, Wood avenue, St. Catherine street from Green avenue to Victoria street, and Lansdowne avenue from Sherbrooke Street to Southern limits, Canadian Mineral and Rubber Company, Toronto, at $115,396. A. D. Shibley, City Clerk, Westmount, Que.

Railroads, Bridges and Wharves

Armow, Ont.

Tenders are being received by J. Jarrell until June 4th for building a cement arch bridge in the Township of Kincardine. Plans, etc., at office of R. B. Campbell, clerk.

Lachine, Que.

The C. P. R. Company contemplate the rebuilding and double tracking of the bridge over the St. Lawrence river at Lachine, Que. With this in view tenders are now being asked and a decision will be definitely reached when these are all received. (Previously noted.)

Maria, Que.

Tenders will be received until June 20th for the construction of an extension to the wharf. Napolean Tessier, secretary, Department of Public Works, Ottawa.

North Vancouver, B.C.

Designs for Second Narrows bridge, prepared by Donald Cameron, call for a high-level structure, costing about $1,250,000. Reeve McNaught, Messrs. J. C. Keith and E. W. Maclean are interested.

New Liskeard, Ont.

Tenders addressed to E. F. Stephenson, Clerk, will be received until June 3rd for the erection of a bridge on the 6th concession of Dymond; bridge to be a 50-foot trestle; wood on the ground, hardware and spikes to be supplied. Work to be completed by July 15th

Ottawa, Ont.

Tenders addressed to N. Tessier, secretary, Department of Public Works, will be received until June 27th for the construction of a wharf at Lennox Island, P.E.I. Plans, etc., at this department and at the office of J. H. Hogan, district engineer, Charlottetown, P. E. I., and on application to postmaster at Port Hill, P. E. I.

Quebec, Que.

It is stated on good authority that tenders for the superstructure of the Quebec bridge will be called for within ten days. Tenders from at least seven firms in Great Britain, Germany, United States, France and Canada are likely to be sent in.

Quesnel, B.C.

The Board of Trade are endeavoring to have a bridge built across the Fraser river here.

St. John, N.B.

It is announced that Mr. Thos. Malcolm has secured the charter of the Quebec and New Brunswick Railway with a view of completing a line from Quebec to St. John.

Toronto, Ont.

The city engineer will have the concrete bridge at the Island constructed by day labor, the lowest tender being $500 above his estimate.

Vancouver, B.C.

It is stated that the C. P. R. will immediately call for tenders on construction of Kootenay Central Railway.

Woodstock, Ont.

F. J. Ure, county engineer, is calling for tenders until June 8th for construction of two concrete bridges. See advertisement in "Tenders and For Sale Department" this issue.

Weston, Ont.

Tenders will be received until June 2nd for the construction of a reinforced concrete arch bridge of 119-foot span; also tenders for grading and filling the approaches. Barber & Young, county engineers, Toronto.

Winnipeg, Man.

The Hyland Navigation & Trading Company have bought five acres on Red river, where they purpose constructing docks and pier to cost about $60,000. J. L. Hyland, president.

AWARDED.

Chatham, N.B.

The contract for the construction of about 8½ miles of railway on the I. C. R. near here costing about $200,000 has been awarded to Morrison & Clark, of Summerside, P. E. I.

Comox, B.C.

Sabin & Stevens have been awarded the contract for clearing the right of way for the Comox extension.

Kingston, Ont.

Contracts for the construction of four Pacific type locomotives for the T. & N. O. Railway have been awarded to the Kingston Locomotive Works, for $90,000. Twelve cinder cars will be built for $15,000, and fifty box cars, with steel frames, for $55,000.

Ottawa, Ont.

The contract for building section 6 of the Trent Valley Canal has been awarded to Haney, Quinlan & Robertson, of Toronto and Montreal. Cost $600,000. Distance, about 6 miles.

St. Thomas, Ont.

The following tenders were received for (1) Union Pond and (2) Salt Creek bridges: Williams & Walker (2) $935; Powles & Gunning, (1) $2,169, (2) $997; J. W. Chivers, (2) $1,100; Jas. Vincent, (1) $1,895, (2) $1,275; Jas. Prew, (2) $1,225; C. C. Stafford, (1) $1,899, (2) $1,329; J. T. Leverton (1) $3,100. Jas. Vincent was awarded the contract for Union Pond bridge and Powles & Gunning that for Salt Creek bridge.

Winnipeg, Man.

Frank Lee, division engineer, of the C. P. R., has let the following contracts: Ditching work between Fort William and Winnipeg to Jackson & Goldie, of Winnipeg; construction of Stonewall station, E. J. McGreevy, Winnipeg; Fort William machine shop, W. H. Braden, Fort William; Yorkton station, T. E. Ames, Winnipeg.

Public Buildings, Churches, Schools, etc.

Amherstburg, Ont.

Tenders addressed to P. Laferte, chairman, will be received until June 9th for the erection of a new Roman Catholic Separate school here. Plans, etc., at store of the above-mentioned.

Belleville, Ont.

The Board of Education will ask the council for an appropriation of $50,000 for collegiate institute.

Brandon, Man.

Plans for the new theatre have been prepared by Architect Sinclair for Dr. Eagles, who is interested. Estimated cost, $30,000.

Cumberland, B.C.

Tenders will be received until June 10th for installing a hot air heating furnace in the public school. Work to be completed by the 10th day of August. For plans, etc., apply Thomas H. Carey, Secretary.

Castleford, Ont.

Tenders addressed to B. Ferguson, chairman School Board, will be received until June 10th for the remodelling and enlarging of school here. Plans, etc., at office of W. J. Humphries, secretary.

Duart, Ont.

Tenders will be called shortly for a new Presbyterian church to be erected. Wilson & Son, architects, Chatham, are preparing plans.

Elkhorn, Man.

The bylaw authorizing the issuing of debentures to the extent of $20,000, for the erection of a new six-roomed school house, was carried.

Fraserville, Que.

Tenders will be received until June 13th for the construction of an armory. Napoleon Tessier, Secretary, Department of Public Works, Ottawa.

Guelph, Ont.

A building campaign will be inaugurated by the Y. M. C. A. here. Mr. A. M. Mitchell, secretary.

Halifax, N.S.

The plans and specifications for the proposed North End school, prepared by Architect C. W. Fairn, have been completed.

Ladysmith, B.C.

The design of Mr. S. B. Bird of Vancouver, has been selected for the new hospital here.

Moncton, N.B.

Tenders addressed to F. A. McCully, secretary, will be received until June 17th for construction of brick and stone school, known as Victoria School Annex. Plans, etc., at office of above, also at office of F. Neil Brodie, architect, St. John, N.B.

Moose Jaw, Sask.

A bylaw will be submitted on June [illegible] to raise $100,000, part of which will be appropriated as follows: Improvement of exhibition grounds, $10,000; erection of produce, hay and stock market, $[illegible]; erection of an isolation hospital, $[illegible]; sub fire station, $10,000.

Montreal, Que.

Messrs. Martineau & [illegible] have commenced work on the construction of alterations and additions to Montcalm School for the Board of Catholic School Commissioners. Marchand & Haskell, architects.

Plans and specifications have been prepared and tenders will be received until June [illegible] for the erection of a church building in St. Catherine County, Bourtneus Que. Plans and specifications can be seen at the office of Mr. A. Brassard, architect, 9 St. James street, Montreal, or at the Presbytery, St. Catherine, Que. Reverend S. Jolicoeur, parish priest.

Mr. Alphonse Venne, architect, is preparing plans for two school buildings in Cote St. Paul. A school for girls will be erected on the site of the recently destroyed St. Paul's Academy, and a new and extensive academy for boys will be also built. A private residence for the Brothers, who will be connected with the boys' school, will be erected adjoining the boys' academy.

Plans and specifications are being prepared and tenders will be received from June 13th to June 22nd for the erection of two schools for boys, and one girls' school for the Catholic School Commissioners, of Maisonneuve. Mr. C. A. Reeves, architect.

Messrs. Hutchison, Wood & Miller, architects, are now receiving tenders for the erection of the First Presbyterian Church, corner Mance and Prince Arthur street.

Tenders will be received until June 6th for fittings required, Central Post Office, Montreal. Plans and specifications on application to H. N. Lymburner, superintendent of Dominion Building, Post Office, Montreal.

New Liskeard, Ont.

Plans for the new fire hall were approved by the Council. Tenders for the erection of the building will be called shortly. Estimated cost, $2,300.

Outremont, Que.

The town council are contemplating the erection of a fire station in the near future.

Orillia, Ont.

Tenders will be received until June 4th for the erection of a Public Library building. W. H. Croker, architect.

Ottawa, Ont.

A construction permit for a new solid brick edifice to replace the present Bell street Methodist church has been issued, $20,000. The addition to the military stores building will cost $30,000, for which a permit has been issued.

It is stated that the building of a Labor Temple here has been postponed.

Tenders addressed to N. Tessier, secretary, Department of Public Works, will be received until June 14th for the construction of an addition to the Eastern Departmental Building. Plans, etc., obtained at above Department. See advertisement in this issue.

Parry Sound, Ont.

Tenders addressed to G. Rowlinson, will be received until June 10th for the erection of a two-storey brick veneered Sunday school room for Methodist church. Plans, etc., at office of J. S. Russell, Stratford or at store of above mentioned.

Portage la Prairie, Man.

Tenders for erection of [illegible] ward school will be called shortly.

Prince Rupert, B.C.

It is reported that a syndicate intends investing $50,000 in theatrical enterprises.

Strathcona, Alta.

Plans for the new post office and armory have been prepared and are awaiting approval. J. M. Douglas, M.P.

Sapperton, B.C.

At a meeting of the hospital board at New Westminster, it was decided to build the new $100,000 Royal Columbian hospital here.

Smith's Falls, Ont.

G. T. Martin, this place, is the architect in charge of the erection of Protestant General Hospital here.

Toronto, Ont.

The Women's Christian Temperance Union will erect a residence for young women. A site has been secured.

Tenders addressed to T. Crawford, Confederation Life Building, will be received until June 4th for the purchase of $16,000 4½ per cent public school debentures for the Township of Scarboro.

Verona, Ont.

The Methodist Church was destroyed by fire on the 26th ulto. Loss $2,000.

Vancouver, B.C.

Tenders for the construction of the new Labor Temple will be called at once. Directors, J. H. McVety, secretary; S. W. Thompson, chairman. Architect, Thomas Hooper. Noted previously.

The Sons of Israel have had plans prepared for a synagogue to be erected on Keefer street. Total expenditure, $10,000.

Winnipeg, Man.

Tenders are being received until June 14th for the erection of two technical high schools. Plans, etc., with J. B. Mitchell, commissioner of school buildings. R. H. Smith, secretary-treasurer, W. P. S.

AWARDED.

Brandon, Man.

The Hospital Board acepted the tender of the Stewart Iron Works, of Winnipeg, for the new boilers and the tender of Jas. McClement for the addition to the laundry at a cost of $4,000.

Calgary, Alta.

Peers & Macleod, lowest tenderers, were awarded the contract for erection of a 12-room school for $98,000; Grant Bros. & Company received the contract for heating, plumbing and ventilation at $15,677. Other tenders were: For the building, D. McDonald, $125,329; G. H. Archibald, $100,626; Groundwater & McFarlane, $99,504.60; L. R. Burn, $105,583; A. A. McPhail, $114,498. For plumbing, heating and ventilation, E. J. Young, $16,011; E. L. Martin, $15,970.65; Wm. Head & Company, $16,716.

Lindsay, Ont.

Messrs. Jay & Sons, Oshawa, have been awarded the contract for the erection of both schools here.

Merritt, B.C.

The contract for the new Presbyterian church has been let to Hyland & McLean.

Moose Jaw, Sask.

The following tenders were received for the erection of Nurses' Home: Navin Bros., $19,000; Thos. Grayson, $16,822; W. H. Ellis, $16,149; Willoughby & Hay, $15,600 (accepted).

Montreal, Que.

Contract for reinforcing steel to be used in the construction of the Earl Grey school building has been awarded to the Pedlar People. Mr. W. E. Ramsay, sales-manager.

The contract for the completion of alterations to premises on Seymour street for the Society of St. Elizabeth has been awarded to R. Labelle. Mr. [illegible], architect.

Contracts for the St. Clements Church, Verdun, Que., have been awarded as follows: Masonry and carpentry, [illegible] Brown & [illegible], roofing, [illegible] ward & Company; plumbing and heating, T. Lessard & Sons, Limited; plastering, G. F. Bowen; electric wiring, Sayer Electric Company. Messrs. Ross & MacFarlane, architects.

Messrs. Sibley & Huot have been awarded the sub-contracts for the roofing of the Earl Grey and the Alexandria Schools for the Protestant School Commissioners. Mr. A. F. Dunlop, architect.

The contract for the installation of a fire escape in the Jean Lever School, recently erected on Wellington street for the Catholic School Commisioners of Point St. Charles, has been awarded to Mr. Derjeron.

Messrs. Marchand & Haskell were the successful competitors in the competition of the Catholic School Commissioners for plans of a school for girls to be erected this summer at an estimated cost of $115,000. Plans will be ready for tendering in the course of a few weeks.

Contract for the erection of a school building for the Protestant School Commissioners at Shawinigan Falls, Que., has been awarded to Heon, Roy & McLeod, general contractors, Three Rivers, Que. Peden & McLaren, architects.

Toronto, Ont.

Contract for galvanized iron, slate and felt roofing on St. Joseph's Convent, has been awarded to A. B. Ormsby, Limited; also that for the galvanized iron and roofing on the Oakwood High School.

R. Robertson & Sons, Limited, this city, have been awarded the masonry contract for the Museum Building, University of Toronto. Notices of other contracts will be announced later. Architects, Darling & Pearson.

The Property Committee of the Board of Education awarded the following contracts for additions to schools: Malvern Avenue High School—Masonry, R. Chalkley & Son, $1,141; roofing, G. M. Bryan, $560; painting, R. G. Johnson, $294. Crawford Street School—Masonry, J. W. Hutcheson, $430; carpentry, Wm. Eaton, $203; painting, J. Taylor, $450. Duke Street School — Masonry, J. W. Hutcheson, $895; carpentry, Fred Armstrong, $535; painting, F. J. Cox, $417. Huron Street School —Masonry, W. T. Jay, $1,375; carpentry, F. Armstrong, $2,445; structural steel for fire escapes, Reid & Burns, $467; plastering, Geo. White, $591; painting, J. Phenimore, $315; heating and ventilating, W. F. Rutley, $1,805.

Residences

Brantford, Ont.

A building permit has been taken out by Mr. H. G. Hartley for a brick dwelling to cost $2,900.

Duncans, B.C.

Tenders are being called for the erection of a residence here for C. H. Price. Plans at 735 Fort Street, Victoria. George C. Mesher, architect.

London, Ont.

A permit was issued to T. H. Robinson, two-storey, brick veneer on Cathcart street to cost $2,100.

Montreal, Que.

Tenders for the erection of a residence to be erected on Querbes street Outremont, for Mr. G. S. Mundie, close June the 1st. House of Browne, Limited, architects, 207 St. James street.

Mr. Charles Bernier, architect, has prepared plans for six flats for Messrs. Bisson & Charbonneau, who will superintend the building of same.

Plans and specifications have been prepared and tenders are invited for the erection of a store and dwelling in Notre Dame de Grace for Mr. T. Decarie. Mr. C. Dufort, architect.

Maisonneuve, Que.

Building permits taken out during present season include: H. Allan, 568 La Salle avenue, two flats, $3,500; H. Aubertin, 76 Fourth avenue, three flats, $4,500; C. Arcand, 91 Joliette, Hochelago, three flats, $5,000; A. Allard, 545 Ontario, four flats, $5,000; F. Brow, 573 Iberville, two flats, $3,000; J. H. Brisson, 242 William David, two flats, $3,000; E. Bernier, 62 Lafontaine, six flats, $6,000; Benoit & Freres, 755 Ontario, three flats, $5,000; A. Bouchard, Orleans street, four flats, $3,500; Corbeil & Freres, 3 Desjardins street, six flats, $7,000; H. & A. Charpentier, L'Epiphanie, two flats, $5,000; F. Charbonneau, 1896 Boyer, three flats, $4,500; E. Dussault, 154 Fifth avenue, ten flats, $8,500; T. Desbien, 602 Orleans, five flats, $5,000; E. Danserau, 673 Notre Dame east, six flats, $6,000; Dufresne & Locke, Desjardins and Ontario, two flats, $2,500; George Gravel, 272 Fourth avenue, four flats, $5,000; G. Gauthier, 660 Letourneaux, five flats, $10,000; Jouvet & Desbien, 177 Notre Dame east, nine flats, $6,000; A. Lapierre, Fifth avenue, Viauville, six flats, $8,000; T. Leduc, 123 Aird, three flats, $4,500; F. Leipen, 858 Ontario, three flats, $4,000; N. Leger, 403 Adam street, five flats, $5,000; A. Louette, 637 Bourbonniere, six flats, $5,000; H. A. E. Morin, 5th avenue, Viauville, four flats, $4,500; Merchessault & Morency, 231 Desjardins, four flats, $4,500; J. D. E. Martin, 660 Bourbonniere, nine flats, $6,500; N. Morin, 219 Ontario avenue, Viauville, six flats, $5,000; A. Picard, 95 Jeanne D'Arc, four flats, $5,000; Roberge & Tremblay, 250 Bourbinniere, six flats, $5,000; H. Aubertin, Fourth avenue, three flats, $5,500; C. Roberge, 616 Lafontaine, three flats, $4,500; D. Roy, 662 Adam street, four flats, $5,000; Stentzel & Company, 209 Sanguinet, eight flats, $10,000; A. Sicard, 7 Fifth avenue, six flats, $7,500.

Victoria, B.C.

Recent building permits include: M. Pollock, one and a half storey dwelling, Denman street and Tolmie road, $3,000; E. M. Trackwell, for a two-storey, 12-roomed dwelling of frame character with concrete foundation on Foul Bay road, $10,500; H. Bowen, for a two-storey 10-roomed dwelling on Rockland avenue of frame construction with stone basement for $20,000.

Winnipeg, Man.

Recent building permits include: A. J. Carson, house, Cathedral avenue, $2,500; Arni Eggertson, three houses, south McMillan avenue, $13,,500; Arni Eggertson, two houses, Burnell, $6,000; D. A. Ross, house, Balmoral place, $5,000; W. Hodgins, house, Margaretta street, $2,500; J. A. Pottruff, house, Kingsway, $7,500; J. C. Fitzgerald, house, Florence avenue, $4,500; E. G. Sherwood, house, Blanche avenue, $2,600; E. Coleman, house, Church avenue, $2,900; G. O. Aulsebrook, house, Fawcett street, $4,000; W. S. Armstrong, house, Hetherington street, $2,500; C. P. Mason, house, Ross avenue, $2,500; W. A. Cameron, house, Arlington street, $4,300; A. Macaw, four houses, Grosvenor, $4,000 each; J. E. Moxley, house, Simcoe, $2,500; J. Leggat, house, Kelvin, $3,300.

AWARDED.

Boissevain, Man.

The contract for building the Methodist parsonage has been let to G. C. Currie and W. J. Armstrong for $3,580.

Montreal, Que.

Contracts have been awarded as follows for hall and flats to be erected for Mr. J. C. Cassels: Plumbing, heating, roofing, and wiring, Alex. Mackay & Company; steel work, Dominion Bridge Company. J. E. Adamson, architect, 630-631 Coristine Building, Montreal.

The contract for masonry and brick work, residence for H. D. Walker, McGregor street, has been awarded to Peel, Pampalon & Peel. Messrs. MacVicar & Heriot, architects.

Messrs. Saxe & Archibald have awarded further contracts in connection with a residence for Mr. J. M. Wilson on Ontario avenue, as follows: Painting, H. Morgan & Company; plastering, J. Morrison & Company, Limited; electric wiring, M. Rubenstein.

The following contracts for a residence for Mr. Horace Joseph, Sherbrooke street, have been awarded: Painting and glazing, J. N. Archand; plastering, Geo. Hamilton. Mr. H. C. Stone, architect.

Outremont, Que.

Contracts for four houses to be erected for Donald Munro and others, have been awarded as follows: Mason, brick and stone work, James Young; carpentry and joinery, C. E. Frost; painting and glazing, F. X. Lavallee; plastering work, H. Oram; roofing and damp-proofing, Campbell, Gilday Company, Limited; plumbing and heating, D. A. Bethune. Jas. E. Adamson, architect, 630-631 Coristine Building.

Westmount, Que.

The general contract for three houses to be erected in Westmount for W. W. Craig, Esq., have been awarded to Jackson & Company.

The contract for the erection of a block of residences for Mr. A. H. Chave to be erected in Westmount, has been awarded to Mr. W. H. Creed. Estimated cost, $20,000. Messrs. Ogilvy and Mitchell, architects.

Winnipeg, Man.

The contract for the building of a residence to cost $8,000 for J. A. Pottruff, has been let to Sparrow Bros. James Chisholm & Son, architects.

Business Buildings and Industrial Plants

Estevan, Sask.

Plans for the two-storey building to be erected for H. J. McNeil have been prepared by McKenzie & Prevost.

Caledonia, Ont.

The Alabastine Company, of Paris, is negotiating for the erection of a new mill here to cost fifty thousand dollars.

Brandon, Man.

Nation & Shewan, and the Adams Shoe Company, have decided to considerably increase their quarters.

Edmonton, Alta.

Dr. J. W. Rowntree of the Van Slyk Plow Company, of Red Deer, is looking for a site for his factory. Edmonton is favorably considered.

It is probable that the Sawyer-Massey Company will in the near future, erect a large warehouse here. Mr. Ramsay, local representative.

Fort William, Ont.

Contracts will be awarded shortly for the construction of annex to Mona block. Estimated cost, $10,000. Architects, Hood & Scott.

Lacey Bros. have purchased 125 feet on May street, where most likely a business block will be erected before the fall.

Georgetown, Ont.

Tenders will close shortly for erection of three-storey mill building of reinforced concrete throughout. Plans, etc., with L. E. Fleck, this place.

Gananoque, Ont.

A bylaw will be submitted to ratepayers to grant a twenty-year exemption from taxation to the D. F. Jones Stove Company of that place on a proposed extension of their plant.

Kamloops, B.C.

It is stated that Robinson & McKenzie, this place, intend to erect a saw mill at some point on the South Thompson.

Kinistino, Sask.

The mill property of the Kinistino Milling Company was totally destroyed by fire on the 27th ulto. Loss was $56,000.

Moncton, N.B.

Fire destroyed the large hotel at Memramcook station owned by the McManus estate. Loss about $10,000.

Merritt, B.C.

The Bank of Montreal has purchased a building site here.

Montreal, Que.

Plans and specifications have been prepared and tenders are now invited for the erection of a four-storey warehouse on St. Lawrence Boulevard for the City House Furnishing Company. Mr. C. Dufort, architect.

Mr. Phil Meehan will shortly erect a three-storey structure to be devoted to light manufacturing purposes, at 8 to 10 St. Monique street, with frontage of 70 feet.

The Hannan Stores, Limited, St. James street, contemplate extensive alterations to their premises.

Plans and specifications have been prepared and tenders will be received until June 1st for the erection of a six-storey fireproof building for Messrs. H. Kellert & Son, corner St. Catherine and St. Urbain street. Messrs. Hutchison, Wood & Miller, architects.

Mistatim, Sask.

The saw mill, stores and other buildings of the Cowan Construction Company were destroyed by fire on the 27th ulto. Total loss estimated to exceed a million dollars. The mill will probably be rebuilt this season.

Owen Sound, Ont.

A syndicate of English capitalists will construct a million-dollar shipbuilding and repair plant and two drydocks at Owen Sound. The plant will be built on the C. P. R. waterfront here, and the company is taking a block of stock in the [illegible]. The construction will cost in the neighborhood of $1,000,000.

Ottawa, Ont.

The sash and door factory owned by J. Des Rivieres, and other buildings were damaged by fire on the [illegible] ulto. to the extent of $20,000.

A building permit for the new building to be erected on Sparks street by A. Rosenthal and Sons, has been issued. The building will cost $125,000, and will be of concrete construction. Weeks and Keefer, of Ottawa, are the architects, and C. E. Deaken, of Montreal, the builder.

Preston, Ont.

Part of the plant owned by J. Ballantyne & Company, was badly damaged by fire on the 26th ulto. Estimated loss, $60,000.

Peterborough, Ont.

Mr. R. J. Manning, of Owen Sound, has opened negotiations with the industrial commissioner, with a view to the establishment of a wood-pulp factory in Peterborough.

Pense, Sask.

Scuber & McIntyre's implement warehouse, and Byer's butcher shop were destroyed by fire on the 29th ulto. Loss was $5,000.

Quebec, Que.

The mill of the Beauce Pulp & Lumber Company, the property of Messrs. Gooday & Foy, merchants, this city, was destroyed by fire on the 25th ulto. Estimated loss, $40,000.

Regina, Sask.

It is stated that the C. N. R. and the C. P. R. have agreed as to Union Depot. Plans have to be filed with the railway commission, after which work will probably be started. The G. T. P. will have their own entrance and their own terminals.

Tenders addressed to Storey & Van Egmon, architects, Regina and Saskatoon, will be received until June 6th for the erection of an office building for the Trustee Company, of Vancouver, Limited. Plans, etc., at office of the above and at the Builders' Exchange.

Saskatoon, Sask.

The sash and door factory of S. Hill & Son was destroyed by fire on the 26th ulto. Loss not stated.

Vancouver, B.C.

J. Farrier, secretary-treasurer, of the Steger Silica Brick Company, is superintending the erection of their plant on False Creek. Work will be started immediately.

Smith & Sherborne, contractors, are erecting the 5-storey concrete building for the Vancouver Ice & Cold Storage Company at a cost of about $60,000; also a 5-storey warehouse on Railway street for Messrs. Martin, Robertson & J. Burns.

A permit has been issued for the erection of the plant for the Pacific Pressed Brick Company, $70,000. E. D. Slager, architect; Messrs. Towselle and J. Farrier, contractors.

Wingham, Ont.

A bylaw granting C. Lloyd & Son a free site for the enlargement of their door factory was carried.

Windsor, Ont.

The bylaw to grant a motor company a free site, etc., was carried.

Welland, Ont.

On June 27th the ratepayers will vote on a bylaw to give certain privileges to H. S. Peters of Dover, N.J., in return for the erection of a [illegible] factory. Architect, T. L. Nichols.

Winnipeg, Man.

Permits were issued to the Canadian Pacific Railway Company for [illegible] shops [illegible], also to the [illegible] Manufacturing Company for a new [illegible] warehouse, $50,000. A new store and apartment block will be erected by Frank Moses at the corner of Jarvis avenue and Main street at a cost of $35,000. The block will be three storeys in height.

Tenders for the new warehouse for Gowans-Kent Western, Limited, will be called shortly. Estimated cost $80,000; materials tyndall stone, pressed brick and stone trimming. Jas. Chisholm & Son, architects.

James Chisholm & Son, architects, this place, are preparing plans for the 6-storey building to be erected by the Sterling Bank of Canada, of which the cost is estimated at about $300,000.

S. H. Chapman, president of the Ontario Wind Engine & Pump Company, it is stated, has arranged for the erection of a large brick warehouse here and at Calgary this summer.

The warehouse of the Canada Manufacturing Company, Nena and Logan avenues, was damaged to the extent of $5,000 recently.

Fire on the 29th ulto., destroyed the plant of the Selkirk Match Company. The loss is $25,000.

AWARDED.

Brandon, Man.

The contract for the new Royal hotel, to be built on Rosser and Thirteenth streets, has been let to Mr. Forbes, a local contractor. Work to be finished by November 1st.

The contract for the new block to be erected by Clement Bros., has been awarded to C. H. Simpson & Company, of Winnipeg. Estimated cost, $75,000.

Fort William, Ont.

The contract for the superstructure of the business building being erected for Jas. Murphy has been awarded to J. L. McRae. Total cost of building, $80,000. Work to be completed by January 1st. Carl Wirth, architect.

Humboldt, Sask.

A. E. Pike has secured the contract for erection of the Union Bank building here.

Montreal, Que.

Contracts have been let as follows in connection with a business building on St. Catherine street for Mr. S. Cuddy. General contract, C. E. Deakin; steel work, Dominion Bridge Company. Mr. William E. Doran, architect.

The contract for the erection of a building for the Canadian Amusement Company has been awarded to J. Jacob & Company. Mr. J. Seath Smith, architect.

The contract for the plumbing and heating of the Beardmore Building, has been awarded to Mr. M. J. Quigley. Mr. H. C. Stone, architect.

The contract for the installation of sprinklers in the Labelle Building has been awarded to the Rockwood Sprinkler Company. Mr. G. A. Monette, architect.

Contract for the alteration to the premises on St. Catherine street west for the Kastell Restaurant has been awarded to Mr. D. M. Long, general contractor. Finley & Spence, architects.

The contract for lathing requirements, Chateau Laurier, Ottawa, has been awarded to the Pedlar People. Mr. W. E. Ramsay, sales-manager.

The contract for the alterations to the building in the rear of the present St. Lawrence Hall, which will be remodelled and used as a [illegible], has been awarded to Messrs. Simpson & Peel, general contractors. Messrs. [illegible] & [illegible], architects. Amount of [illegible].

Messrs. J. T. Lago & Company have been awarded the contract for the erection of a reinforced concrete building at Lachine, Que., for the Automatic Railway Signal Company at an estimated cost of $25,000.

Port Colborne, Ont.

David Dick & Sons, Limited, Welland, have the contract for building the International Cork Factory here. Cost, about [illegible]. The contract calls for completion by August 15th next.

Sault Ste. Marie, Ont.

Contract for the galvanized iron and roofing on the Bank of Montreal has been awarded to A. B. Ormsby, Limited, Toronto.

Swan Lake, Man.

W. H. Rosewarne, of Winnipeg, has the contract for the erection of the Bank of Hamilton here. Cost about $25,000. Architect, W. Fingland, Winnipeg.

Winnipeg, Man.

The contract for the 3 storey store and office building, corner Notre Dame and Princess streets, for Jos. M. McGreevy has been awarded to Thos. Kelly & Sons for $70,000. G. W. Northwood, architect.

Snyder Bros., of Winnipeg, have secured the contracts for the new C. P. R. depot at Minnedosa, Man., and the Yorkton station. They also have the new school at Estevan, Sask.

Power Plants, Electricity and Telephones

Estevan, Sask.

A suitable site for a municipal electric light plant has been purchased by Dr. D. R. Davies.

Farnham, Que.

The ratepayers have approved of a bylaw to raise $100,000, for the erection of a dam and for general power development work.

Ingersoll, Ont.

Two bylaws, one to raise $39,800 to acquire the plant of the Ingersoll Power & Light Company, and the other to raise $15,000 to make improvements and extensions to the plant, were carried.

Moncton, N.B.

The agreement prepared by the city council with the Street Railway Electric & Gas Company for the leasing of the city lighting plant for thirty-nine years has been endorsed by the ratepayers.

Moose Jaw, Sask.

A bylaw will be submitted to the ratepayers on June 17th to raise $100,000, of which $35,000 will be used in extension of electric light system.

Neepawa, Man.

The ratepayers endorsed a bylaw authorizing the town council to sell the municipal telephone system to the provincial government.

Point Grey, B.C.

The B. C. E. R. agrees to supply this municipality with light for ten years. Five hundred electric lights similar to those used in Vancouver will be installed.

Renfrew, Ont.

The bylaw to raise by debenture the sum of $82,000 for water power development was carried.

Victoria, B.C.

The city will shortly call for tenders for fifty additional arc lights. Cost, about $3,500.

AWARDED.

Victoria, B.C.

The contract for supplying ornamental pillars and fittings, for the new street lights on Douglas street has been awarded to Hutchison Bros., at a cost of $54 each.

Winnipeg, Man.

The Board of Control have recommended the following for acceptance (in each case the lowest): Northern Electric & Manufacturing Company whose quotation, based on 280,000 duct feet was 7.82 cents a foot or $21,896, was given the contract for conduits. This allows for the completion of all runs, plans for 1910, and provides a general amount of surplus stock for short extensions.

The contract for the McPhillips street sub-station—known as No. 2—goes to the engineer of construction, J. W. Astley, at $11,423.19. The equipment of substation No. 2 is to be placed in the hands of the Canadian Westinghouse Company at a cost of $29,616. This includes a bank of three transformers of 1,500 k.w. gross capacity as well as the necessary auxiliaries for installation in the terminal station building. In respect to the contract for construction of conduit runs, the recommendation will provide that G. M. Gest be awarded the contract, which is not to exceed $40,000.

Miscellaneous

Hull, Que.

It is stated that this municipality will shortly purchase a fire engine similar to those in use in Ottawa.

Montreal, Que.

Recent building permits include the following: Diamond Flint Glass Company, 179 Delorimiere avenue, one house and one factory, $7,000; St. Matthew Apartments, Limited, apartment house, $45,00; J. E. Lalond, 2623 Esplanade, two houses containing four dwellings, cost $2,500; N. Legault, 315 Breboeuf, one house containing three dwellings, $3,000; J. H. Lafond & Company, 2623 Esplanade, two houses containing twelve dwellings, $8,000; Cusson & Gagne, 171 Lac Cartier, one house containing three dwellings, $3,000; E. Douesnard, 282 Aqueduct street, two houses containing six dwellings, $6,000; V. Depatie, 2472 Mance, one house containing two dwellings, $4,000; McGill University, Sherbrooke street, one educational building, cost $150,000; L. P. Venne, 237 Ontario east, one house containing two dwellings and one store, $6,000; A. Fortier, 15 Mt. Royal avenue, one house containing three dwellings, $3,000; Montreal Steel Works, St. Patrick and St. Etienne street, two houses containing six dwellings, $11,000; A. Deschamps, 1308 St. Hubert, two houses containing six dwellings, $5,500; Collette & Frere Company, Limited, 477a Moreau, one house containing three dwellings, $3,000; Jos. Villeneuve, 457 Panet, one house containing five dwellings, $8,000; Jos. Senecal, 1381 St. Andre, two houses containing six dwellings, $6,000; A. Christin, 1588 Labelle, two houses containing four dwellings and one store, $5,000; Fortier Freres, 2553 Mance street, one house containing three dwellings, $5,000; O. Berthiaume, 455 Plessis street, one house containing five dwellings, $7,000; H. Rheaume, 618 St. Hubert, two houses containing eleven dwellings, $7,000; T. Raymond, 1177 Chabot, two houses containing four dwellings and one store, $6,000; Rev. P. J. Heffernan, St. Anthony's Church, two houses containing six dwellings, $4,000; the School Commissioners St. Gregoire of Thaumatnge, Marie Anne street, one house and one educational building, $18,000; the School Commissioners St. Gregoire de Thaumatnge, on Delorimiere avenue, one house and one educational building, $80,000; H. Cardinal, 462 Champlain, two houses containing four dwellings and two stores, cost $8,000; Berthe Claude, 1821 Park avenue, one house, $6,000; Leon Pichi, 1760 Mance, one house containing three dwellings, $7,000; E. Martel, 569 Lfrontenac, two houses containing six dwellings and one store, $5,500; D. Boucher, 660 Sherbrooke east, two houses containing six dwellings, $5,500; F. Freniere, 611 Lafontaine, one house containing three dwellings, $3,500; A. Ladoucer, St. Dorothee, County Laval, two houses containing six dwellings, $6,000; Dement & Duffield, Toronto, Ontario, one house and one store and one warehouse, $12,000; A. L. Whittet, 839 Cadieux, alterations to one house, one dwelling and two stores, $2,300; Montreal Light, Heat & Power, alterations to factory on Craig street, $16,000; Quebec Bank, alterations to building, $2,500; S. Carsley Company, alterations to building, $4,000; C. P. R. Company, alterations to the St. Lawrence Hall, $10,000; J. W. Reed Company, Craig street west, alterations to factory, $2,500; S. L. E. Cuddy Company, 535 St. James street, factory building, $40,600; Bisson & Charbonneau, two houses containing six dwellings, $15,000; W. Ouimet, 1371 St. Lawrence boulevard, one house containing two dwellings, $4,000; M. Martin, 1790 St. Lawrence boulevard, one house containing three dwellings, $2,500; Canadian Amusement Company, 207 St. James street, one house, $8,000; F. Charlebois, 150 Boyer, one house containing two dwellings, $3,400; J. H. Labelle, 2178 Hutchison, one house containing two dwellings, $5,500; Catholic School Commissioners, Plateau Academy, one school building, $14,500; J. Hogue, 695 Berri, six houses containing twelve dwellings, $8,000; H. Hogue, 1591 St. Hubert street, four houses containing eight dwellings, $5,000; A. Lamoureux, 853 Berri, two houses containing four dwellings, $3,200; P. Meehan, Atwater avenue and St. Antoine street, factory building, $10,000; S. C. Rodier, 62 St. Martin street, three houses containing twelve dwellings, $6,000; A. Lemoine, 1227 Simard, one dwelling and four houses containing eight dwellings, $9,000; M. C. Renaud, 340 Chambord, two houses containing four dwellings, $4,000; C. J. Miller, 1163 Bordeau, two houses containing six dwellings, $4,000; J. A. Therien, La Patrie Building, four houses containing twelve dwellings, $8,000.

Ottawa, Ont.

Recent building permits include: Patrick Labelle, apartment house, to cost $32,000; Jas. E. Wilson, solid brick shop, Bank street, $5,000; J. Robertson, solid brick dwelling, Centre street, $7,000; J. G. Davidson, brick veneer dwelling on Carling avenue, $4,000; W. Burns, brick veneer dwelling, McLeod street, $3,000.

Toronto, Ont.

Recent building permits include: E. Pullan, 3-storey brick addition to warehouse, Adelaide street, $11,000; Park Blackwell Company, 3-storey brick addition to factory, Bathurst and Front, $15,000; Mrs. G. Smith, 2-storey and attic brick dwelling, Heath and Warren, $13,500; Bowles & Company, 2 detached 2-storey brick dwellings, on Keele, $7,200; Masten & Fitzgerald, 3 attached 2-storey brick stores and dwellings, Gerrard, $7,000; C. C. Robinson, 2-storey and attic brick dwelling, Sultan, $9,000; L. M. Hall, 6 detached 2-storey brick dwelling, Willoughby, $12,000; Dunfield & Company, 4-storey brick addition to store and office, 102 Yonge street, $12,000; Isaac Lennox, 2-storey brick dwelling, 90 Spencer avenue, $5,000; J. H. Maguire, 3 detached 1¼-storey brick dwelling, Keele, $10,000; Jackson & Brooks, one pair semi-detached 2-storey brick dwelling, on Fairview, $4,000; G. F. Hurlbut, 1 pair semi-detached 2-storey brick dwellings, on Stonehouse crescent, $4,000; C. Rathbone, 2½-storey brick dwelling, on 100 Wells street, $4,000 Mr. Mitchell, 2-storey brick dwelling, corner Pape and Bain, $4,000; Jackson & Brooks, pair semi-detached 2-storey brick dwellings, Fairview, $4,000; A. Bryce, 2½-storey brick dwelling, Russell Hill road, $6,000; H. J. Rea, 2-storey and attic brick dwelling, Binscarth road, $4,500; J. G. Booth, pair semi-detached 2-storey brick dwellings, Warren road, $4,000; A. Hutchins, 2-storey brick dwelling, 7 Lippincott street, $4,000; Geo. Martin, 3 attached 2-storey brick stores and dwellings, Harbord and Givens, $9,000; Mrs. Grafton, 2½-storey brick dwellings, on Russell Hill road, $7,500; Mrs. G. F. Madden, 3-storey brick apartments, on 36-38 St. Albans, $35,000; J. W. S. Corley, 2-storey and attic brick dwelling, on Dunvegan road, $10,000; Mrs. M. Clarkson, 2 pair semi-detached 2-storey brick dwellings, on Symington, $10,000; Elias Rogers Company, roughcast stable, near Shirley, on Lansdowne, $8,000; Wilson & Slayer, pair semi-detached 2-storey brick dwelling, Albany, $8,0000; J. Pearl, 4 attached 3-storey brick stores and dwellings, corner Bloor and Lippincott, $14,000; R. Lankin, 7 pair semi-detached 2-storey roughcast dwellings, brick fronts, 649 Pape avenue, $22,000; G. White, pair semi-detached 2½-storey brick dwellings, Montrose, $6,500; T. F. Fleming, 3 detached 2½-storey brown dwelling, Evelyn avenue, $7,500; C. Buschlen, 2 pair semi-detached 2-storey brick dwellings, on Gerrard east, $8,000; M. Chapman, 2-storey and attic brick dwelling, on Alina, $11,000; R. D. McLeod, 2 detached 2-storey and attic brick dwelling, on St. Clair, $9,000; Love Bros., 4 detached 2-storey brick dwellings, on Dearbourne avenue, $9,600; W. A. Forster, pair semi-detached 2-storey and attic brick dwellings, on corner Mutual and McGill, $6,500; A. Butler, pair semi-detached brick dwellings, on Euclid, $6,000; W. A. Goy, 4 attached 2-storey rougncast dwelling, brick fronts, on Marshall, $6,200; Love Bros., 3 pair semi-detached 2-storey brick dwellings, on Dearbourne, $12,000; Walter Scott, 4 attached 2-storey brick dwellings, on Lansdowne, $7,000; W. P. Gundy, 2-storey brick dwelling, on Hawthorne avenue, $10,000; Cameron Stewart Company, 3 detached 2½-storey brick dwellings, Redford avenue, $9,600; Wm. Vokes, 2 detach 2½-storey brick dwelling, Indian road, $7,000; G. E. Baycroft, 3 attached 2½-storey brick dwelling, Bain, $6,600; Thos. Leeming, 2½-storey brick dwelling, High Park Boulevard, $6,000; J. A. Gallagher, 3-storey brick stores and dwellings, on Danforth, $10,800; W. W. Hultz, 4 detached 2½-storey roughcast dwelling, on Dingwall avenue, $7,000; A. E. Simpson, pair semi-detached 2-storey brick stores and dwellings, on Dovercourt, $7,500; Salvation Army, 1-storey brick salvation army ..all, corner Northumberland and Dovercourt, $8,500; Geo. Knaggs, pair semi-detached 2-storey and attic brick dwellings, on Triller, $9,000; Gordon Marr, 2 detached 2½-storey brick dwelling, near Keele, on Humberside, $6,000; Mrs. A .H. Read, pair semi-detached 2-storey brick dwelling, near Laughton, on Gourley, $5,000; E. G. Switzer, 2 detached, 2-storey brick dwelling, near Sunnyside, on West Marion, $5,000; Our Lady of Lourdes, Church, near Earl, on Sherbourne, $60,000; Home for Incurable Children, 2-storey addition (brick), to dwelling, on 152 Bloor street east, $6,000; J. A. MacMurchy, 3 pair semi-detached 2½-storey brick dwellings, near Dundas, on Chelsea, $15,000; J. Smith, 3 attached 2-storey brick dwellings, on Osler avenue, $6,000; Dundas Building Company, 2 pair semi-detached 2-storey brick dwellings, on Weston road, $7,200; John Cook, 3 attached 2-storey brick dwellings, on Concord, $7,500; Brown & Cooper, altering dwelings into stores, on 147-149 Church, $7,600; G. L. Thompson, 5 pair semi-detached, 2-storey brick dwellings, near Harbord, on Mntrose, $20,000; M. Tuckett, 2 pair semi-detached 2-storey brick dwellings, near Sinclair, on Chelsea, $8,000; Dr. G. H. Burnham, 2-storey brick dwellings, on corner Lynwood and Warren, $10,000; H. Sheinkman, 3 pair semi-detached 2-storey brick dwelling, on Symington, $15,600; F. Love, pair semi-detached 2-storey brick dwellings, corner Garden avenue and Sunnyside, $6,000; J. W. & W. W. Schofield, 3 pair semi-detached 2-storey brick dwellings, on 264-274 Symington, $12,000; J. S. Lougheed, pair semi-detached, pair semi-detached, 2½-storey brick dwellings, corner Sunnyside and Garden, $6,000; F. Elliott & Sons, 2 detached 2-storey brick dwellings, Parkway, $5,000; E. P. Atkinson, 2½-storey, brick dwelling, High Park Boulevard, $6,000; H. Sparrow, pair semi-detached 2½-storey brick dwellings, Hampton, $5,000; Proctor & Gallagher, 3 attached 2-storey and attic brick dwellings, corner Humberside and Mavety, $10,500; Justice Riddell, 2-storey and attic brick addition to dwelling, 109 St. George street, $9,000; W. B. Charlton, 2½-storey brick dwelling, on Rowanwood, $5,500; K. Gladman, 3 pair semi-detached 2-storey roughcast dwellings, brick fronts, corner Pape and Hazelwood, $9,000; Dr. Peaker, 2-storey brick dwelling, on 133 Jameson; R. C. Brown, 2-storey and attic brick dwelling, Clarendon avenue, $20,000; J. S. Robertson, 2½-storey brick dwelling, on Castle Frank avenue, $10,000; I. W. W. Plewes, 3-storey brick flour mill, on 373 Front street east, $11,000; Edward Moore, 10 detached 2-storey frame dwellings, on Coxwell avenue, $7,000; Jas. Paton, pair seim-detached 2½-storey brick dwellings, on Roncesvalles, $5,600; J. Lancaster, 4 attached 2-storey brick stores and dwelling, on Dundas, $10,000; J. A. Egan, pair seim-detached 2-storey brick dwelling, on Thorold, $5,000; F. Duff, 2-storey and attic brick dwelling, on High Park Boulevard, $7,000; F. M. Tuckett, 2 pair semi-detached 2½-storey brick dwelling, on Chelsea, $9,600; Dominion Realty Company, Limited, 2-storey brick bank and apartments, on corner Bloor and Dufferin, $12,000; Mrs. C. Shafe, 3 attached 2-storey brick dwelling, on 284-6-8 Salem avenue, $6,000; H. Lant, 4 attached 2-storey brick and stucco dwelling, on McGee street, $5,000; Love Bros., 2 pair semi-detached 2½-storey brick dwellings, on Dearbourne, $12,000; J. M. Walker, 3 attached 2-storey brick dwelling on corner of Osington and Manchester, $5,000; W. Pennock, 4 pair semi-detached 2-storey brick dwellings, on Emerson, $16,000; Elmer Duff, 4 detached 2½-storey brick dwellings, on Indian road, $16,000; J. C. Grace, 2-storey brick dwelling, corner Avenue road and Clarendon avenue, $7,500; Hall & Son, 2-storey and attic brick dwelling, on Indian road, $5,500; Weismiller & McKenzie Bros., pair semi-detached 2-storey brick dwelling, West Marion stree 2-storey brick dwelling, West Marion street, $7,000; McKenna & [illegible], one pair semi-detached 3-storey brick stores and dwellings, on College, $7,000; J. R. Gifford, 2 pair semi-detached 2-storey roughcast dwelling, brick fronts, on Hazelwood avenue, $6,000.

Vancouver, B.C.

Recent building permits include: Dr. D. H. Wilson, brick building, Pender street, $7,750; J. Rogers, frame dwellings (2), 1962-1968 York street, $5,000; G. D. McKay, frame apartment, 1546 Yew street, $10,000; J. Stephen, 1235 Eleventh avenue west, $4,500; A. J. Waddle, 1380 Thirteenth avenue east, lumber company, C. P. R. reserve on south side of False Creek, $4,500. A. Clarke, four storey brick block on Granville street, $50,000; Martin Robinson and John Burns for a five-storey warehouse at 341 Railway street, $40,000; Dr. G. A. McGuire, M.L.A., 2720 Yukon street, $8,500; Mr. Roberts, 436 Thirteenth avenue west, $2,500; City of Vancouver, fire hall at 906 Twelfth avenue, $8,500; C. P. R. extension of Pender street freight sheds, $35,000; Northern Crown Bank, alterations to block on Hastings street, $14,000; E. G. Findlay, brick block, Broadway, $12,000; A. Campbell, 1462 Broadway east, $4,750; two additional storeys on the Woodward departmental stores at a cost of $35,000; Sharp & Gabriel, 2135 Eighth avenue west, $2,500.

Winnipeg, Man.

Recent building permits include: Mrs. E. Barclay, dwelling house, Spence street, $3,500; J. F. Parker, two dwelling houses, $4,000; F. W. Scott, for a dwelling house on Kingsway, $13,000; F. Moses, dwelling house, corner of Mulvey avenue and Helen street, $5,000; F. E. Andrews, dwelling house, Wellington crescent, between Harrow street and Academy road, $12,000; F. W. Scott, residence, Kingsway, $13,000; F. S. Andrews, house, Wellington crescent, $12,000.

AWARDED.

Vancouver, B.C.

Tenders for fire hose were as follows:—Canadian Rubber Company — Keystone, $1.10; Patrol, $1.00; Squelcher, $1.05. Vancouver Rubber Company — Eureka, $1.25; Paragon, $1.10; Trojan, 95 cents; Peerless, $1.00; New Peerless, $1.05. Dunlop Tire Company — Dunlop, $1.10; Niagara, $1.05. It was recommended that the purchase of 5,000 feet of hose be divided as follows: Eureka, 2,000 feet; Keystone, 1,500 feet; Dunlop, 1,500 feet.

Winnipeg, Man.

The tender of the Webb Motor Fire Apparatus Company, of Vincennes, Ind., for a motor hose wagon, was accepted. The wagon is a 50 h.p., and will cost $4,690.

The B. C. Gazette gives notice of the incorporation of the following companies: The Nelson Iron Works, Limited capital $150,000, incorporated to carry on the business of engineers, boiler-makers, etc.; Phillips Arm Timber Holding Company, capital $225,000; B. C. Timber & Land Company, capital $100,000.

A. T. Stephenson, building inspector of Red Deer, Alta., sends in the following news regarding the progress in municipal construction: The C. P. R. is constructing a new station opposite the end of Ross avenue to cost $20,000. The Canadian Bank of Commerce in July will commence the erection of a new two-storey block costing about $25,000. The town of Red Deer is building cement sidewalks on the two principal business streets. G. H. Harvey is completing a new house costing $2,500. W. H. Lord is building an addition to his residence at a cost of $3,300. R. G. Cornet is building a new residence costing $1,200. Mrs. Richardson is building a new residence at a cost of [illegible]. The [illegible] Manufacturing Company [illegible] shirt and overall factory, two storey.

Tenders and For Sale Department

Tenders for Boilers

Sealed tenders addressed to the undersigned and marked "Tender for Boilers," will be received until noon on SATURDAY, JUNE 11TH, 1910, for two Return Tubular Boilers, 72 inch by 18 feet, to maintain a working pressure of 150 pounds per square inch.

Specification may be obtained from the City Engineer on application.

C. O. DAVIDSON,
City Clerk.

Dated at Prince Albert, Sask., May 17th, 1910. 22

City of Regina

Province of Saskatchewan

Sewage Disposal Works

Sealed tenders will be received until noon, MONDAY, JUNE 6TH, 1910, for the construction of Sewage Disposal Works for the City of Regina. Tenders must be accompanied by an accepted bank cheque or other satisfactory deposit for the amount of $5,000.

The deposits of unsuccessful tenderers will be returned as soon as the contract is signed.

The right to reject any or all tenders or to waive any irregularities therein is to be at the discretion of the City authorities.

Plans, specifications, forms of tender and all information may be obtained on application to the City Engineer's office, Regina.

A. J. McPHERSON, C.E., Consulting Engineer.
A. E. CHIVERS, City Clerk.

Regina, Sask., May 12th, 1910, 22

Sealed tenders addressed to the undersigned, and endorsed "Tender for addition to the Eastern Departmental Building, Ottawa," will be received at this office until 5.00 p.m. on TUESDAY, JUNE 14TH, 1910, for the construction of an addition to the Eastern Departmental Building, Ottawa.

Plans, specifications and form of contract can be seen and forms of tender obtained at this Department.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature, the nature of the occupation and place of residence of each member of the firm must be given.

Each tender must be accompanied by an accepted cheque on a chartered bank, made payable to the order of the Honorable the Minister of Public Works, equal to ten per cent. (10 p.c.) of the amount of the tender, which will be forfeited if the person tendering decline to enter into a contract when called upon to do so or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

Th Department does not bind itself to accept the lowest or any tender.

By order.
NAPOLEON TESSIER,
Secretary.

Department of Public Works,
Ottawa, May 18th, 1910.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department. 22

To Builders and Contractors

Sealed, separate or whole, tenders will be received by the undersigned up to six o'clock p.m. of SATURDAY, JUNE 4TH, 1910, for all the work and material (with hot-water heating) required in the erection of a Public Library Building at Orillia, Ont.

Plans, specifications and particulars may be had at the office of architect, on and after Monday, 23rd of May.

The lowest or any tender not necessarily accepted.

W. H. CROKER,
Architect.

Orillia, May 18th, 1910. 22

Tenders

Sealed tenders, addresesd to either of the undersigned, will be received until noon on WEDNESDAY, JUNE 8TH, 1910, for the construction of a 50-foot reinforced concrete arch bridge over Kettle Creek, in the Village of Belmont, for the Counties of Elgin and Middlesex. Plans and specifications may be seen at the offices of the undersigned. A marked cheque for the sum of $200,000 payable to either the Treasurer of Elgin or Middlesex, must accompany each tender as a guarantee of good faith. The committee reserves the right to reject any or all tenders.

JAS. A. BELL, County Engineer,
St. Thomas, Ont.

CHAS. TALBOT, County Commissioner,
London, Ont.

St. Thomas, May 21st, 1910. 22

Notice to Architects

Competitive designs for a Residence for the Lieutenant-Governor of the Province of Ontario, proposed to be erected on Bloor Street, in the City of Toronto, will be received by the undersigned at the Department of Public Works, Parliament Buildings, Queen's Park, Toronto, up to noon on the 15TH DAY OF JULY NEXT,

Information and particulars as to the extent and character of the said designs can be obtained upon application to the office of the Secretary of Public Works.

Subject to such terms, conditions, etc., the following premiums are offered:

For the design most approved......	$1,000.00
For that approved as second in merit	500.00

The designs for which said premiums will be awarded are to be selected and approved of by the undersigned, and the same are thereupon to become the property of the Province.

J. O. REAUME,
Minister of Public Works.

Department of Public Works, Ontario.
Toronto, May 12th, 1910. 23

Wanted

Tenders for mill building to be made of reinforced concrete throughout. Three-storey building, 260 x 64. For plans and specifications apply to L. E. FLECK, Georgetown. Tenders will close shortly. 22

To Architects

Competition Plans

The Board of Management of Knox College, Toronto are desirous of obtaining plans for their proposed new College Buildings to be erected on St. George Street to the westward of the Lawn of the University of Toronto.

Conditions of Competition, with all information, can be had on application to the Rev, John Sommerville, Confederation Life Building, Toronto.

Plans must be sent by the FIRST OF NOVEMBER NEXT. 23

Tenders

Sealed tenders for brick veneered Sunday School room, consisting of two storeys and basement, for Methodist Church, Parry Sound, will be received by the undersigned until noon on JUNE 10TH, 1910.

Plans and specifications may be seen at my store, James Street, or at the office of J. S. Russell, Stratford.

The lowest or any tender not necessarily accepted.

GEO. ROWLISON,
Recording Steward.

Parry Sound, May 18th, 1910. 22

Temiskaming and Northern Ontario Railway Commission

Sealed tenders addressed to the undersigned, and endorsed on envelope "Tender for Nipissing Junction Spur," will be received up to 12 o'clock, noon, JUNE 8TH, for Clearing, Grading, Embankment Protection, Driving of Piles, Building of Culverts and Laying of Tile, that may be required in connection with the construction of a branch line for the T. & N. O. Railway, between North Bay and Nipissing Junction.

Plans and specifications may be seen at the office of the Chief Engineer, North Bay, and the Secretary-Treasurer, 25 Toronto Street, Toronto.

Certified cheque on a chartered bank of Canada, payable to the order of the Secretary-Treasurer of the Commission, for 10 per cent. of the amount of the tender, must accompany each tender.

Lowest or any tender not necessarily accepted.

A. J. McGEE, Secretary-Treasurer,
25 Toronto Street, Toronto, Ont.

Dated at Toronto, May 18th, 1910.

Papers inserting this advertisement without authority will not be paid for same. 22

Notice

The Town of Petrolia intends to construct about 7,000 square yards of Street Pavement on a residential street. The pavement must be of the noiseless character, and the Council invite contractors to submit prices for such class of pavement. Prices are asked to be sent in before MONDAY EVENING, JUNE 6TH. Address all communications to

J. McHATTIE,
Town Clerk.

22

Tenders Wanted

Tenders will be received until MONDAY, JUNE 6TH, for Masonry, Brickwork, Carpenter Work, Iron and Steel Work and Roofing in connection with the erection of a Laundry Building for The Sisters of Our Lady of Charity, West Lodge Avenue, Toronto.

Plans and specifications can be seen, and all other information obtained at the offices of

J. M. COWAN, Architect,
65 Adelaide St. E., Toronto.

The lowest or any tender not necessarily accepted. 22

Tenders for

Concrete Sidewalks, etc.

The Corporation of Port Hope invite tenders for the construction of five lineal miles or thereabouts of Concrete Sidewalks and Crossings, with the necessary works connected therewith, in accordance with detail and specifications prepared therefore, copies of which, with forms of tender, may be obtained on application to the undersigned. A marked cheque equal to five per cent of the gross amount of the contract to be furnished with each tender, and the lowest or any tender not necessarily accepted. Tenders received to 13TH JUNE, NOON.

J. W. SANDERS,
Town Clerk.

Dated, 25th May, 1910. 23

TENDERS

TENDERS FOR ADDITIONS AND ALTERATIONS TO ENGINE-HOUSE AND BOILER HOUSE AT MAIN PUMPING STATION, FOOT OF JOHN STREET, TORONTO.

Bulk tenders, or tenders for the several trades mentioned below, in connection with the above building, will be received by registered post only, addressed to the undersigned up to noon on TUESDAY, 14TH JUNE, 1910.

1. **Mason Work, etc.**
2. **Carpenter Work.**
3. **Galvanized Iron and Roofing.**
4. **Painting and Glazing.**

Plans and specifications may be seen and forms of tender and all information obtained at the office of the City Architect, Toronto.

Envelopes containing tenders must be plainly marked on the outside as to contents.

The usual conditions relating to tendering as prescribed by city by-laws must be strictly complied with, or tenders may not be entertained.

Tenderers shall submit with their tender the names of two personal sureties, or the bond of a guarantee company.

The lowest or any tender not necessarily accepted.

G. R. GEARY, (Mayor),
Chairman Board of Control.

City Hall, Toronto, May, 1910.

Tenders for Pavement

Sealed tenders will be received by the City Clerk of the City of Guelph, until 5 p.m., on FRIDAY, JUNE 10TH, 1910, for approximately 11,700 square yards of Bituminous Pavements.

Plans and specifications may be seen, and instructions to bidders and forms of tender obtained at the office of the City Engineer.

Tenders will be received for the concrete base and curbs, and the surfacing, separately.

The lowest or any tender not necessarily accepted.

JAMES HUTCHEON,
City Engineer.

Guelph, May 21st, 1910. 23

Bridge Tenders

Tenders will be received by the undersigned up to noon of WEDNESDAY, JUNE THE 8TH, for the construction of two Concrete Bridges of 20-foot span, near the Village of Thamesford, for the County of Oxford. Plans and specifications at my office or with W. W. Day, Reeve of East Nissouri, Thamesford.

F. J. URE, County Engineer,
Woodstock, Ont.

22

Corporation of Oshawa

Concrete Sidewalks

Tenders will be received up to noon of MONDAY, JUNE 13TH, 1910, for the construction of 5,500 lineal feet (more or less) of Cement Concrete Sidewalks.

Specifications and other information may be tained at the office of the Town Engineer.

The lowest or any tender not necessarily accepted.

FRANK CHAPPELL,
Town Engineer.

22

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra.

CIVIL ENGINEER, Good Organizer, full control of all grades, and labor. Just completed large Water Power Development six months ahead of time, is open for engagement.—Box 981, CONTRACT RECORD, TORONTO. 23

POSITION AS GENERAL OR JOB SUPERINTENDENT, thoroughly practical, well up in general construction, large experience in reinforced concrete, at present employed, prefer to go West.—Apply Box A, Contract Record, B31 Board of Trade Bldg., Montreal, Que.

Positions Vacant

[illegible] heading [illegible] word per [illegible]

WANTED—TRAVELLING SALESMAN to represent the manufacturing bank, office and store fittings. Must be competent to make sketches, etc. Man having experience in architect's office preferred. Apply, Box 974 "Contract Record," Toronto. [illegible]

Miscellaneous

[illegible]

[illegible] cars C. N. O. R. Apply to A. Prentice, 619 [illegible]

Business Notes

The Corbet Foundry & Machine Company, of Owen Sound, Ont., have started to build a new factory, which they hope to have completed by November. It will consist of main building, [illegible] pattern house, cubalo and boiler house attached. The building will be of cement, steel trussed, galvanized corrugated iron roof and will have no supports but clear spans, and will be fitted out with the very latest machinery.

The Canadian Government has decided to renew subsidies previously granted for 3,048 miles of railroad. In all 44 subsidies are proposed, and on the basis of $3,200 a mile the total will amount to $8,862,400, but there is small probability that 10 per cent. of this amount will ever be called for. Among the subsidies renewed are the following: To the St. Mary's & Western Ontario Railway Company, for a line of railway from Embro to Exeter, not exceeding 36 miles. To the Manitoulin & North Shore Railway Company, for three lines of railway, not exceeding in all 194 miles. To the Algoma Central & Hudson s Bay Railway Company, for three lines not exceeding in all 275 miles. To the Bracebridge & Trading Lake Railway Company, for a line of railway from Bracebridge, in Muskoka, to a point at or near Baysville, Ontario, not exceeding 16 miles. To the Lac Seul, Rat Portage & Keewatin Railway Company, for a line not exceeding 22 miles. To the Nepigon Railway Company for lines not exceeding in all 80 miles To the Ontario, Northern & Temagami Railway Company for a line from a point at or near Sturgeont Falls in a northwesterly direction, to a point on the westerly shore of Lake Temagami, in the district of Nipissing, not exceeding 50 miles. For a line of railway from Sharbot Lake or Bathurst stration, in the Province of Ontario, or between these points, via Lanark village, to Carleton Place, not exceeding 41 miles. To the Erie, London & Tillsonburg Railway Company for a line of railway from Port Burwell to London, not exceeding 35 miles. To the Torонton Lindsay & Pembroke Railway Company for a line of railway from Golden Lake to Bancroft, not exceeding 51 miles. To the Kingston, Smith's Falls & Ottawa Railway Company for a line of railway from Kingston to Ottawa, not exceeding 101 miles. To Pacific, Northern & Omineca Railway Company for a line of railway from [illegible] westerly, to or toward Peace River, not exceeding 110 miles. To Southern Central Pacific Railway Company, for following lines of railway: (a) from a point two miles west of Pincher station on the Crow's Nest Pass branch of the Canadian Pacific Railway, northwesterly, not exceeding 10 miles; (b) from a point two miles west of Pincher station on Crow's Nest Pass branch of Canadian Pacific Railway [illegible] Kettle River Railway Company for the following lines of railway [illegible] to a junction near Merritt with Nicola, [illegible] water River to a point on the Fraser River, [illegible] tral Railway Company for a line of rail[illegible] Railway at or near Elko, not exceeding 186 miles. [illegible] Company for a line of railway at or near [illegible] 21 miles.

Bituminous Macadam Road Construction

Instructive Data for Municipal Authorities—Practical Directions as to most Satisfactory Methods of Work—Specifications for Placing Material

Tar and asphalt are the materials which have been most generally employed, either in construction of new roads as a binder, or as a surface treatment for old roads to keep the dust down, says the State Highway Commissioner of Maine in his annual report for the past year. Where new macadam has been built with a bituminous binder or old roads given a surface treatment, it has been observed that the wearing of the road has practically stopped and that the roads have been far more satisfactory to all classes of users.

The roadbed is prepared as in the construction of a regular macadam or gravel road. On this is then spread seven inches of No. 1 stone, that is, crushed stone varying in size from 1¼-inch to 2½-inch, which after thorough rolling with a steam roller, compacts to about five inches. Over this is spread a three-inch layer of No. 2 stone which has been thoroughly mixed and coated with a bituminous binder. After spreading, this is allowed to stand from a few hours to a day, depending upon the temperature of the air, after which it is rolled down to about two inches. It is then allowed to set until sufficiently hard, after which the surface is painted with hot refined coal gas tar or hot asphalt and immediately covered with from ¼ to ½-inch of dry stone screenings from which all dust has been removed. A light rolling is then given to force the screenings into the surface voids of the No. 2 course and into the surface coat of bituminous material. This completely seals the surface of the road, making it impervious to moisture and also makes a gritty surface which affords a good foothold for horses.

Details of Construction

The following points must be observed in carrying out this work:

The stone must be clean and dry. Tar or asphalt will not adhere to dirty, dusty or damp stone. A uniform grade of stone and bituminous materials should be used. Thorough mixing and careful spreading and rolling must be insisted upon. The road must not be opened for traffic until the bituminous binder has completely set.

The advantages claimed for this form of construction are that it is waterproof and consequently sanitary; noiseless, dustless, and that the wear is almost imperceptible, making the maintenance expense very light. The road is resilient, making it very easy for horses to work upon. Automobile traffic does not injure it, but rather benefits it. The statements made in this paragraph are not conclusions based upon experience in Maine. They are the conclusions of officials who have been building and observing these roads for four or five years.

The cost of this construction, generally speaking, is about 50 per cent. more than for ordinary macadam. The method described above is called the "mixing method." Similar results are accomplished by what is called the "grouting method" or "penetration method." By this method the bituminous material instead of being mixed with the No. 2 course is spread upon it after it is partially rolled and allowed to penetrate. The road is finished as in the mixing method. It has seemed to your commissioner that such uniform results could not be obtained by this method as by the mixing method, and no work of this kind has been undertaken.

The method of conducting this work is as follows: A contract is let for the construction of a plain macadam road. A supplementary contract is let specifying at what prices extra labor on account of the bituminous work will be furnished and what discounts will be made on account of substituting the bituminous second course for the ordinary macadam. In this way the exact labor cost can be determined. The department or the city or town furnishes the bituminous material.

Specifications for placing the bituminous material are as follows:

SPECIFICATIONS FOR BITUMINOUS MACADAM

These specifications are supplementary to and an integral part of the Standard Specifications of the State Highway Department, for macadam roads, and in no way replace them, except in so far as the construction of the No. 2 course and finished surface is concerned.

Plant—The roller used in rolling the bituminous macadam surface shall not weigh more than ten tons.

The kettles shall be of such shape and size that they can be easily transported by hand from point to point. No kettle, however, shall be used that will not hold two barrels of tar, except by special permission of the engineer.

When mixing on the road, a mixing board shall be provided for each gang so engaged. The mixing board shall be made of 2-inch plank in three sections each 8 x 8 feet.

Bituminous Compounds—Coal-tar shall be placed in the kettles so that the depth of tar is not more than 18 inches unless otherwise directed by the engineer. Water in the tar shall be caught when the tar is being run into the kettle. If any rises to the surface of the tar in the kettle it shall be skimmed off. When tar is the only bituminous compound used, it shall be heated for two hours at a temperature between 150 degrees and 180 degrees Fahr., then raised to at least 200 degrees before using.

Kettles shall be placed so that hot tar will not have to be carried more than 50 feet.

In storing tar, barrels shall be laid on their sides with the bungs up. Asphalt shall be placed in the kettles in such quantities as may be desired, and brought to a heat of 350 degrees Fahr., before using. When the bituminous compound consists of tar and asphalt mixed half and half, the tar shall be heated in one kettle and the asphalt in another. The tar shall be brought to 200 degrees Fahr., before using, the asphalt to 350 degrees Fahr., before using. In mixing by hand the tar shall be placed on the stones before the asphalt.

Stone—The No. 2 stone must be dry and free from dust. No No. 1 stone will be allowed in the No. 2 course. No work shall be done when the No. 1 course is wet. The work shall not be resumed until the stone has dried out to the satisfaction of the inspector.

Mixing Bituminous Compound—The bituminous compound shall be mixed with the stone either by hand or by machine until the stone is thoroughly coated to the satisfaction of the engineer or inspector. One and one-quarter gallons of bituminous compound shall be used per square yard of surface, unless otherwise directed by the engineer. The No. 2 stone shall be laid to a thickness of three inches and rolled to two inches. The No. 2 course shall be rolled as directed by the engineer or inspector.

Painting—After the surface has been thoroughly rolled and shaped up to the satisfaction of the engineer, the surface shall be swept clean. The bituminous compound shall be spread on the surface either by brooms or mops. Six-tenths of a gallon of the bituminous compound shall be used per square yard of surface, unless otherwise directed by the engineer.

Dust—Dust screenings shall be perfectly dry. Dust screenings shall be put on to a thickness not exceeding ¼-inch unless otherwise directed by the engineer or inspector. No dust shall be put on until the surface has set to the satisfaction of the engineer or inspector.

When the surface is required to be painted, the dust screenings shall be put on immediately after the flush coat of bituminous compound has been applied. The surface shall be rolled as directed by the engineer or inspector.

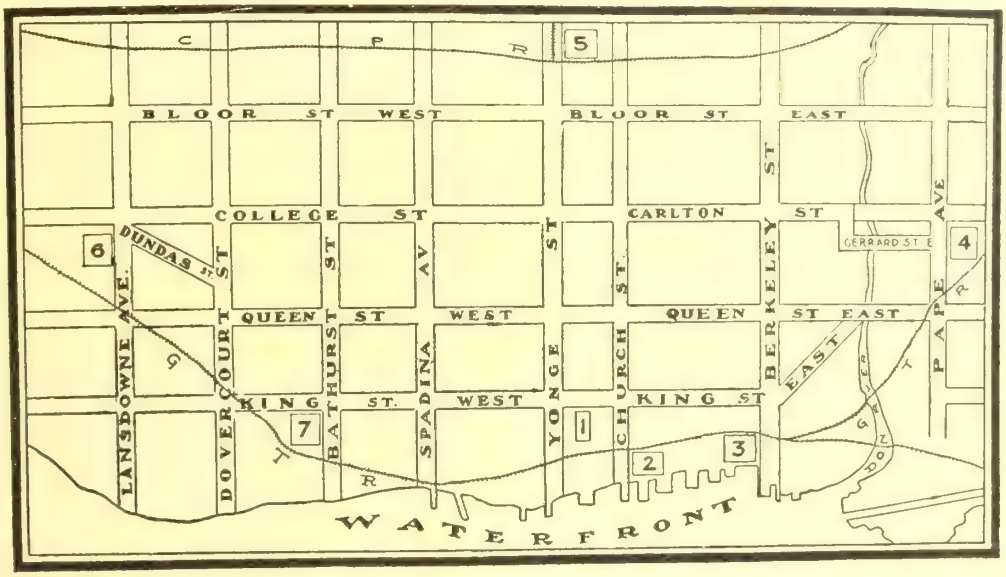
Screenings for Flush Coat—Screening for the tar flush coat shall consist of crushed stone of the kind and quality above specified, that will pass through a ½-inch circular ring and be retained on a screen having meshes ⅛-inch square.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards:

Telephone
Main
4
1
5
5

No's
2,
4,
5,
6



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Creosoted Wood Paving Blocks

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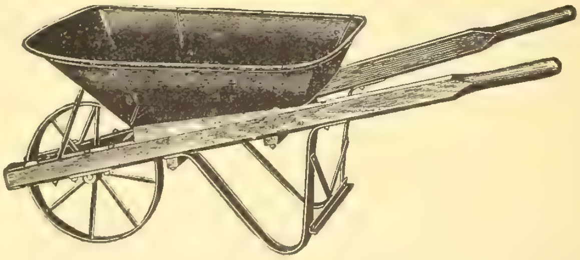

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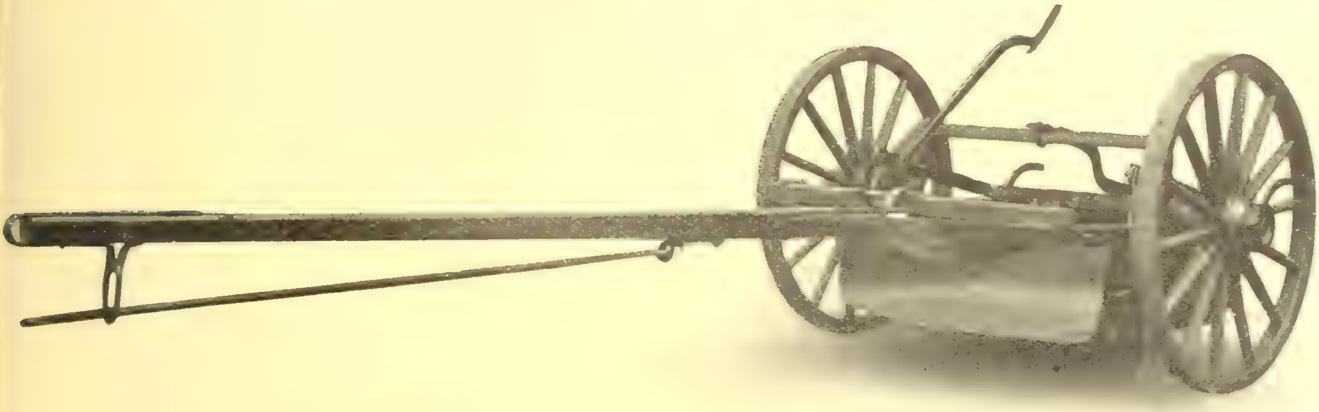

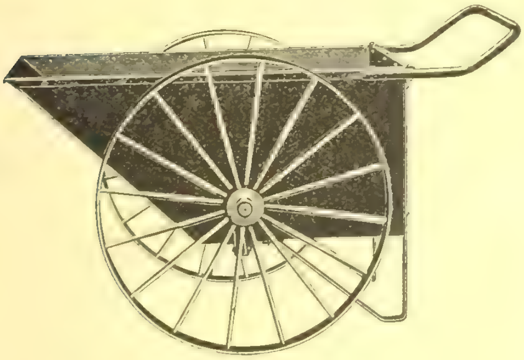

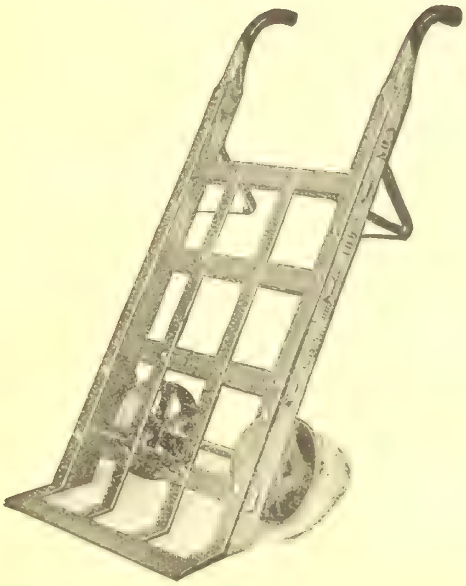

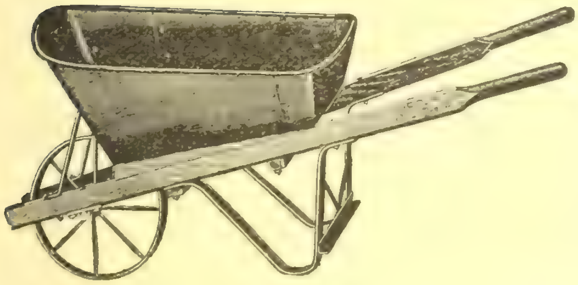

us figure with you also on your heavy equipment if you are in the market for Steam Shovels, Rock Crushers, Hoisting Engines, Derricks, Excavating Buckets, Concrete Mixers, Concrete Hoists, Concrete Buckets, etc., etc.

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Calgary - - Crown Block
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Glidden's Liquid Cement

This material is a very high quality of cement incorporated with or carried in suspension by a waterproofing medium or vehicle of unusual durability and water resisting features. You are aware of the fact that when a cement wash of neat cement and water are applied as a finishing coat upon cement construction, whether it be concrete, stucco or of whatever composition, the life of same is extremely limited, due to the fact that there is no durable vehicle with which to bond the cement to the surface, and naturally a cement wash will not last longer than a few months, after which it cracks and [illegible] disintegrating and presenting a very unsightly appearance.

Furthermore, you cannot bond plaster to concrete permanently, while Liquid Cement bonds itself very firmly to a concrete surface, producing a most beautiful, decorative effect.

Liquid Cement is made in imitation of Bedford Sandstone, as also in a variety of practical shades, including colonial and pompeian buffs, as well as pure white, and is especially intended for waterproofing and uniforming cement, stucco, plaster and concrete surfaces, both interior and exterior, with the view of producing a pleasing, decorative effect.

You are aware of the fact that cement and concrete surfaces have a tendency to dry out with a variation of color, some of the surface showing light, while the other is dark; this is a serious drawback in the construction of cement buildings and one of the principal objections which Architects have to cement and concrete construction as pertaining to dwellings and high-class buildings.

Liquid Cement overcomes this difficulty and places before the Architects a material of immense value in the direction of carrying on the construction of such buildings. In factory buildings, warehouses and similar construction, this question is not paramount, but in the use of Liquid Cement to waterproof these buildings and prevent the inroads of dampness through the concrete walls, which means the corrosion of steel reinforcement, it is really more vital and important; for that reason, Architects and Engineers who are making a specialty of concrete construction work will find our Liquid Cement, in its various colors, indispensible in carrying on this particular class of work.

Specifications.

Have the surface dry and clean. Brush the material out evenly over the surface. Use two coats in order to obtain an excellent, durable finish. Old surfaces should be thoroughly cleaned by means of wire brushing, before applying the material. Allow two or three days between coats. The material should be very thoroughly stirred before using and occasionally while being used, in order to develop the best working, brushing and uniform covering properties.

The material should be applied under favorable weather and temperature conditions.

THE GLIDDEN VARNISH COMPANY, Cleveland, Ohio

Distributed in Canada by

Stinson-Reeb Builders Supply Company Eastern Townships Bank Building
Montreal, Quebec

G. WOOLLISCROFT & SON., Ltd

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Managing Director A. E. Blizzard now visiting Canada. He will welcome any suggestions and wants your orders and instructions. Address communcations care of Contract Record, Toronto.

Tiles—for Walls, Floors, Ceilings and Roofs.

Terra Cotta—Red, Buff and Stone Color.

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"**Glow**" **Fires** with Tile or Faience Surrounds in Endless Variety of Color and Design to suit all Canadian tastes.

Paving Blocks for **Roads,** these have beaten the American in the Standard Tests.

ESTABLISHED 1886
Contract Record
A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

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Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 24 Toronto June 1, 1910 No. 22

Recent Developments in the Purification of Public Water Supplies

The paper dealing with the above subject prepared by Mr. R. S. Lea for the Canadian Society of Civil Engineers, and reprinted in this issue, should be of the greatest interest to all whose professional interests identify them in any way with this field as well as to those whose civic duties make it desirable that they have some knowledge of the present day systems of water purification and the relative merits thereof.

The extracts from the author's paper published herein relate entirely to recent developments. It may be of interest to refer to Mr. Lea's introductory remarks, which set forth how the idea of sand filtration and its direct application originated with Simpson in 1829. The discovery by Dr. Koch of the plate culture method of studying bacteria marks the begining of a period, since when it has been possible to deal with the purification of water in a rational and scientific way. This discovery, which took place in the year 1880, constitutes the second advance in the art. A third advance soon followed in the discovery of the utility of coagulation, or rather its adaption to a useful purpose in the field of water purification.

Since that time such developments as have taken place in either system have been confined chiefly to improvements in materials of construction and in appliances for operation and control. Apart from this, however, a much better idea now prevails of the importance of the characteristics of the water as factors in the selection of the type of system best adapted for its purification. As a result, plants of recent date seldom fail to accomplish the purpose contemplated in their construction, and, though the last decade has not been productive of any fundamental changes with respect to either system, such improvements as have taken place may, perhaps, on account of their great practical worth, be of interest on the eve of what promises to be a permanent filtration movement in this country.

In illustrating and describing the main features of a slow sand filtration, Mr. Lea prefaces his remarks as follows:

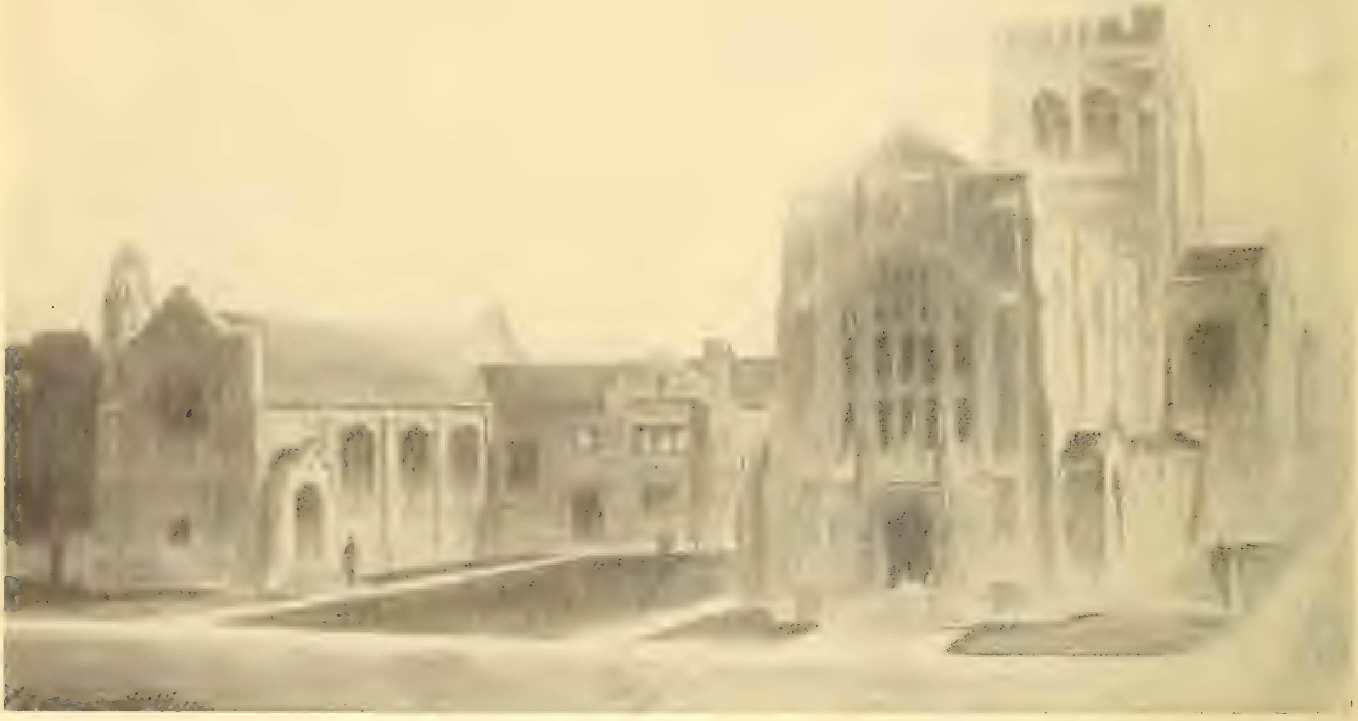
"As might be expected of a system, which from its inherent simplicity was susceptible of but little improvement since its first appearance, there is not very much to record in the recent development of slow sand filters. In this familiar type the raw water after preliminary sedimentation, where necessary, is applied to beds consisting of horizontal layers of rather fine sand supported by gravel, and underdrained, the whole being enclosed in a suitable tank or basin. The efficiency of this system to some extent depends upon, and is improved by, the fineness and depth of the sand employed, and on the lowness and uniformity of the rate adopted."

The subject of water filtration is a most vital issue for all concerned, and we shall make an effort to publish a number of authoritative articles that will be of material benefit to those interested. In our next issue we hope to publish some interesting information relating to the ozone system of water purification.

Prairie Provinces' Great Showing

It is estimated by Vice-President Whyte, of the C.P.R., that the area of land devoted to wheat growing in the prairie provinces this year will be 8,600,000 acres, or between 12 and 15 per cent. more than last year. Of this total, 4,600,000 is in Saskatchewan alone. Of oats there will be 4,500,000 acres, slightly more than last year; of barley about 1,000,000 acres, and of flax about 600,000 acres, nearly double the acreage last year given to this grain. Less than 10 per cent. of the arable land of Saskatchewan is now under cultivation. There has been very little anxiety about the wheat crop in the West this year, and the most optimistic predictions that have been made are likely to be more than fulfilled. The outlook for the crops is of the greatest significance to the building industry and others interested in the development of the country. The present situation must be particularly gratifying to all concerned.

The Board of Control of Montreal received 127 tenders for public works in one day last week. The comment of the Montreal "Star" conveys a subtle suggestion as to the manner in which contracts were awarded in Montreal in the past: "No less than 127 tenders were received. Nothing like this in the matter of competition is reported in civic annals. The custom in the past was for a few contractors to send in offers. As these favored individuals generally carried off the contracts, competition practically died out. The number of offers received to-day is considered to be an eloquent tribute to the new system of civic government."



Complete Scheme for Rosedale Presbyterian Church, Toronto.—Architects: Chapman & McGiffin, Toronto.

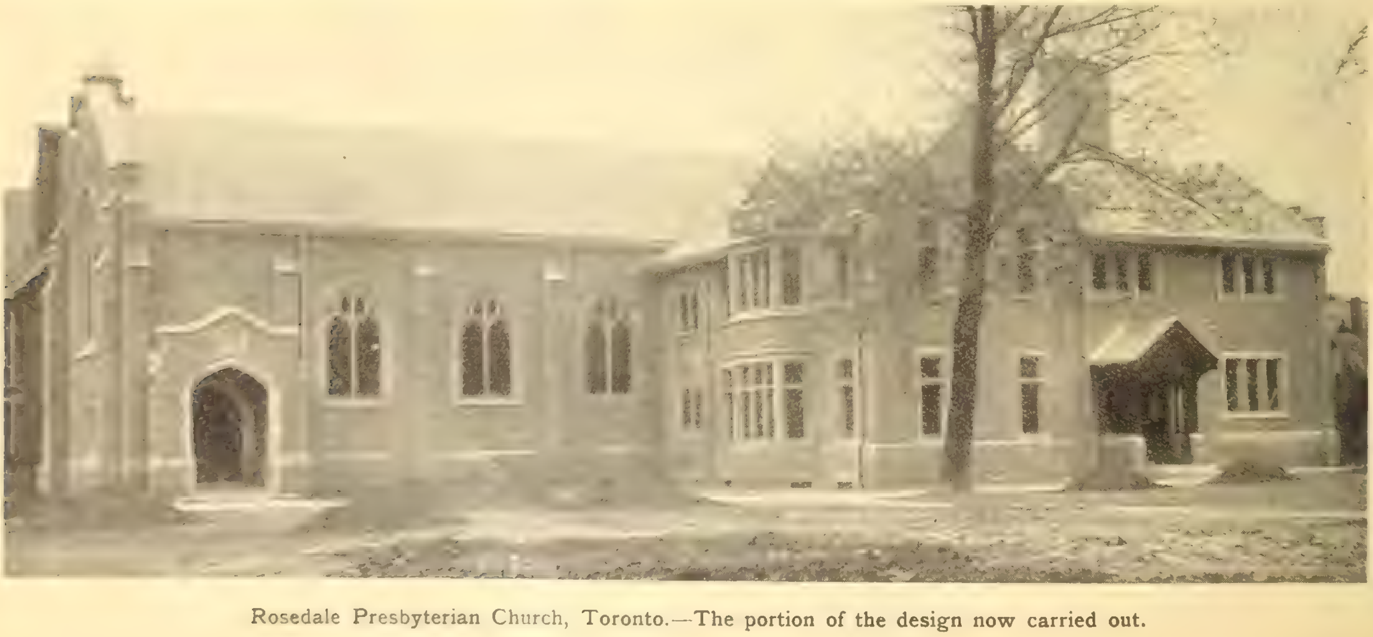
Rosedale Presbyterian Church, Toronto

In undertaking the design for the Rosedale Presbyterian Church, the architects, Messrs. Chapman & McGiffin, had to deal with a problem that was unique in several respects. The congregation elected to carry out a portion of a comprehensive scheme, rather than build a large church in an unsubstantial and unsatisfactory manner. When completed, the group shown in the perspective will form a quadrangle—the main church on the right, the Sunday-school on the left, and the administration building at the end. By this plan the buildings are enclosed to a certain extent from the surrounding property.

The requirements in brief were to secure a building which for the present could be utilized as a chapel and later on be converted into a Sunday-school. The main desideratum was that the present building should have a distinctive church character. The portion of the scheme now carried out, as shown in the second illustration, provides church accommodation, suited to the present needs of the congregation, and various administration rooms, including ladies' room, trustees' room, vestry, kitchen and serving pantry; also, in basement, lockers and showers for the boys' club.

The general character of the design is perpendicular Gothic, the administration portion developing into the English collegiate. An effort was made to keep the lines severe and substantial, giving the style more of the Scotch cast than the English.

The materials used in the building are Credit Valley greystone and Indiana limestone trimmings and tracery



Rosedale Presbyterian Church, Toronto.—The portion of the design now carried out.

The roof is of unfading green slate. The interior furniture and trim are of oak, and the roof trusses of Georgia pine. The walls are stucco plaster with Indiana stone trimmings.

The system of heating and ventilating evolved has eliminated all radiators in the church part, the heating being obtained by means of artificial draught. The air is drawn in from the outside, passed through a bank of coils, and forced into the church by means of a large fan. By this means perfect ventilation is secured and there is no possibility of having the heat localized as in the case of radiators.

The contracts for the portion of the scheme now carried out were executed by the following firms: Witchall & Son, Lifited (represented by Aikenhead Hardware Hoidge & Son, plastering; W. Davidson & Company, carpentry; J. R. Seager, plumbing and ventilation; Hope & Son, Limited ,represented by Aikenhead Hardware Company, Toronto), metal sash; R. Rennie & Son, roofing; Globe Furniture Company, furnishings.

Contracting for Profit

The contracting business, like mercantile business, is buying and selling materials and labor for profit; yet it is surprising how many contractors and builders buy from the same dealers year in and year out, without taking the trouble to discover if they could not do better elsewhere. The old rule, "An article bought right is half sold," applies as much to the contractor and builder as to any other line of trade, says the "National Builder."

Rosedale Presbyterian Church—Interior of Sunday School.

The successful contractor buys his supplies where he can do the best and take advantage of every trade discount, for here is where a large percentage of his profits is made. Do not continue buying from one dealer. See whether you are paying more than you should or not. Some dealers, when they have a customer for a long time, take it for granted prices are not obtained elsewhere, and charge the top notch price. It is necessary, in order to meet competition, for you to buy to the best advantage.

Concerning Credit—No business can be carried on successfully without a line of credit, even though you pay for everything as you get it, or send cash with the order. It would not be practical to do so; there is bound to be more or less errors occurring in the filling of orders. If the goods are paid for, it is not so easy to get these errors corrected, and for many other reasons a good line of credit is necessary for the contractor. The better your credit, the closer prices you can get. Supply men classify contractors about as follows:

First, the gilt-edged man, or the contractor who pays promptly, who can get anything he wants without delay. Second, the contractor who must depend on his collections to pay his bills, but is known to be reliable. Third, the man who is noted to be slow pay. Fourth, the man who has lost his credit and cannot get anything unless he pays cash, or has the owner to go security. Fifth, the new beginner, who has not yet proved himself.

Very few can rank in the first class, at least for an indefinite length of time, after beginning, but can soon advance to the second class, which is nearly as good, even if you have not got a large capital.

Do not try to deceive in any way. If you are not known to the dealer, you can easily prove to him you want to do the right thing. Take him into our confidence, tell him what you are getting for the work, so that he will see that your price is sufficient to pay for the materials. It is his right to protect himself against loss, and he will be only too glad to help you along. Many of the largest contractors have started in this way; it will not take you long to do it. A few jobs carried through successfully will be sufficient to prove your ability. It is not a question so much of your having a large capital, but a question of your honesty and ability to figure safely. If a contractor takes a piece of work for less than it can be done for, and he has not the capital to pay the difference himself, it gets the supply man into trouble. Try to live up to your agreements. Never get into the third and fourth classes. Remember that dealers have rights and do not infringe on them.

You will not be long in business before you will be rated by the mercantile agencies, and when you correspond with business concerns outside of your own locality, you will be quoted according to your rating. Unless you are rated as good pay, you will be required to pay spot cash for materials ordered, which would hamper you very much.

The Handling of Help—The handling of help is another phase that calls for careful and judicious management. Some men can accomplish more with the same crew than another can, without working them any harder. The writer has learned from experience that it pays best to hire the best mechanics to be had and pay them the best wages. Then you have a right to expect them to do the work and do it right without watching them. It is a serious mistake to try to get your work done with cheap, handy men. You have to waste your time or the time of another good, expensive man to oversee them. There are, of course, certain places where you can use some such help to advantage, but in the main it does not pay. They waste materials, and the work is not satisfactory to the architect or owner. Very few men are good, all-around men, so you must find out what each is best at, and keep each as much as possible where he will accomplish the best results.

Some contractors keep changing men all the time and drive them like a lot of slaves. I do not believe this to be good practice. It is better to keep a steady crew, if possible, and when you find a man is not doing the square thing with you, let him go, but by keeping mainly the same crew you get to know the best qualifications of each man, and where to place him to the best advantage. He also gets to know you, and knows what you want, and if harmony exists on your work, he will try to do his best for you, but a [illegible] ing the men will find them taking advantage of him at every chance.

Modern Apartment House at Vancouver, B.C.

The above illustration is a view of the substantial apartment house now being erected at Vancouver, B.C., by the Pacific Investment Corporation. The structure is being built upon a lot 132 feet by 131 feet, at the southeast corner of Davie and Jervis streets, which is the crown of the hill, and affords a magnificent view in all directions.

The building as it will appear on Jervis street will have a prominent entrance court, 30 feet wide, with [illegible] pathways on each side, and the driveway in the centre.

The building will be six storeys high, faced with deep red pressed brick, and light trimmings, excepting at the two principal entrances, which are to be either light sandstone or terra cotta.

The dimensions of the building are 131 feet by 111 feet, leaving 21 feet on the south side for a garden plot, and for securing sunshine to a major portion of the apartments. There are no inside rooms in the building. All have abundance of light and air, 60 per cent. of the apartments being on a "corner" with windows on two sides. There will be 82 apartments in all, comprised as follows: 56 3-room, 22 4-room, 2 5-room and 2 2-room. In addition, there is a store on the corner suitable for grocer or druggist. Provision is also made for a cafe below the ground floor on Davie street, with stairway from the entrance vestibule.

The basement will contain the heating plant, hot water service, vacuum cleaning plant, storage rooms, and janitor's quarters.

For the convenience of tenants, there will be dumb waiters, messenger and telegraph call boxes, mail chutes, patent sanitary garbage chutes, and vacuum cleaning system. Near the passenger elevator will be a 'phone with connection to each apartment.

There will be 22 fire hose reels, besides portable chemical fire extinguisher on each floor; also two outside fire escapes and two auxiliary inside stairs, well separated from the main staircase and elevator.

It is estimated that the property when completed will represent an outlay of $157,000.

The architects for the building are Messrs. Wright, Rushforth & Cahill, Vancouver. The contract for the excavation and concrete basement was awarded quite recently to the Wells Construction Company, Vancouver. The remaining contracts will probably be awarded during the next week or two.

WRIGHT RUSHFORTH & CAHILL
ARCHITECTS
CONSTABLE BLOCK 709 DUNSMUIR ST.
VANCOUVER, B.C.

Pacific Investment Corporation's Apartment Block, Vancouver, B.C.

Novel Method of Heating Materials for Concrete

During the construction work on a recent power development it became necessary, in order to carry on winter concreting, to devise some way of heating materials more economically than the usual methods.

Ordinarily when the temperature of the air drops to 15 degrees or 20 degrees Fahrenheit, concreting becomes a hazardous undertaking if one is to secure good results and still keep the cost of construction within reasonable limits.

Our summer method of measuring materials was to charge a single horse dump-cart at the crusher bin with the measured proportion of crushed rock. From the bin the cart was driven to the sand pile, where enough sand was added to complete load.

Of course, one could heat sand and water to any degree, but the problem was to find a way of heating the rock quickly and cheaply. It was solved satisfactorily to every one in this way. Taking some 1¼-inch pipe and cast tees, a frame was made consisting of a set of 18 pipes crossing to and from the respective headers. ⅛-inch holes were drilled every inch on one side of the pipes. A piece of canvas was rivetted to the top of the frame of pipes, forming a cover, and one header was connected to a boiler under pressure of 80 pounds steam. A block and tackle was then attached to the set of pipes. This enabled the operator to move it quickly.

When work began in the morning, the cart, charged with rock, was driven under heater. The operator lowered it directly on the cold crushed stone and then turned live steam on for one-half minute by his watch. He then raised the heater ready for the next cart.

The rock was thoroughly warmed, all pieces of ice being melted, and when warm sand and warm water were added, a batch of concrete was mixed, that set nicely in the coldest weather. In fact, in looking at the finished wall one cannot detect any difference in the concrete mixed during weather of a temperature of 25 degrees and that placed in summer.

Notes on the Hardening of Portland Cement

Prepared Especially for this Journal by Mr. A. G. Larsson, C. E., Chemist, Grey and Bruce Portland Cement Co., Owen Sound, Ont.

As my paper on the hardening of Portland cement, read at the London convention of the Canadian Cement and Concrete Association, was intended rather for the cement expert than for the practical cement user, I shall now try, in a few words, to deal with the subject in a way to suit even the latter.

Until one or two years ago it was generally considered that the hardening of Portland cement was caused solely by the crystallization of hydrate of lime. This theory fails, however, to explain even the most important phenomena in the mortar-technique. For instance, how is it possible that a cement mortar can harden in water or even remain firm and intact after it is set, if the soluble hydrate of lime is the cause? Besides, how can a mass of hydrate of lime crystals give the high tensile strength which our present Portland cement possesses? The first to give a reasonable explanation to these and other phenomena in the hardening process was Prof. Michaelis, of Germany, who in a paper read last year at the meeting of the German Association of Cement Manufacturers, laid the foundation for the so-called hydrogel theory. The views I shall now bring forth are founded on this.

From researches which I have made and from reports published by other investigators, I have been able to enlarge the same in some respect, thus adding my unite to a great man's work.

Portland cement is, as we know, a combination of lime with silica and oxides of iron and alumina. The clinker we obtain from our rotary kilns will, however, invariably, when ground to cement, give a product so quick setting as to render it almost useless for ordinary work. The manufacturer must on this account add some kind of retarder. He uses for this purpose gypsum, plaster of paris, or calcium chloride. Besides these matters there is, as a rule, a small amount of magnesia present.

Positive and Negative Substances

The substances entering the cement may from a chemical, or rather an electrical, point of view, be divided into two classes, the positive and the negative. There exists, as we know, a certain amount of attraction between these two kinds of bodies. Lime and magnesia belong to the first group, silica and the oxides of iron and alumina to the latter.

Let us now assume that water (about 22 or 26 per cent.) has been added to the cement. Several reactions set in now, depending on certain chemical and physical forces. One of the first is the liberation of the lime which enters the water as hydrate of lime. This process takes place faster or slower depending on the nature of the cement, i.e., comparatively fast for a quick setting and slow for a slow setting product. More and more lime will thus immigrate into the water. But, as was said above, it is positive, and the residue of the cement will naturally become more and more negative. The attraction between this and the lime must then increase in the same ratio; in other words, it is getting more and more difficult for the latter to separate and dissolve. The process would thus soon cease. Some changes, however, are setting in, and these enable it to continue. The negative part of the cement, especially the silica, has the property to combine with itself.. We may also note the difference between a slow and a quick setting cement. The former gives the silica more time and opportunity to unite with itself to more complex units than the latter. This circumstance explains the difference in strength between the two kinds mentioned.

Owing to these reactions, the amount of lime in the water is steadily increasing. The concentration will finally reach the point where a little of the lime and some water are forced to unite with the formed complex silica compounds. The resulting body has been named "hydrogel." It has also been called mineral glue, as it resembles ordinary glue very much. At this stage the mass is colorless and sticky. It is practically insoluble in water, but absorbs the same to a great extent, thereby swelling. It acts like a filter towards dissolved crystalline bodies, as, for instance, hydrate of lime, i.e., it retains them, thus preventing their escape

Properties of Oxide of Alumina

Let us now for a moment leave the silica compounds and see what part the oxides of iron and alumina take in the hardening process. As comparatively small quantities of the former are present in the ordinary Portland cement, its actions, as far as the setting is concerned, are of little importance. We will therefore consider only the latter (Al_2O_3). At least two different kinds of reactions must here be taken into account.

One of these may be called the hydrating process. A part of the lime is separating from the cement and dissolves in water as hydrate of lime. Owing to the comparatively weak negative properties of the oxide of alumina, the attraction between it and the lime is only small. The reaction, therefore, takes place more easily and more rapidly than is the case when silica is acting. This circumstance explains why a cement high in alumina has a tendency to be quick setting.

The oxide of alumina has very little tendency to form such complex compounds, as is the case with the silica. Therefore, it seldom, if ever, unites with lime to a hydrogel-like substance. Instead of that, the two form thin hexagonal crystals of calcium hydro-aluminate.

The other reaction to be considered in connection with the oxide of alumina is, that it, together with lime, unites with gypsum, thus forming a new body [illegible] absorption of water and great expansion. This circumstance explains why gypsum, when present above certain limits, causes "cracking." The above reaction also explains why some Portland cements resist sea water better than others. There are always more or less sulphates in sea water. These form with the lime in the cement gypsum, which, in its turn, will react as described above. As already noted, this causes expansion, which will naturally be the greater, the more oxide of alumina there is available. The less of this a Portland cement contains, the better will it resist the deteriorating influence of sea water.

Canadian Cement Contains Little Magnesia

As for the magnesia, I can say that our ordinary Portland cement contains very little; consequently, its actions during the hardening process are of no interest to the cement user. Five per cent. [illegible] considered the magnesia limit. The average Canadian product is somewhere round 3 per cent., with one or two exceptions. Specifications demanding less than 3 per cent. are too severe, as it has been proven beyond doubt, that as long as the magnesia is not above 5 per cent., it has no detrimental influence. I do not think anybody in the whole of Canada ever saw magnesia cracking Portland cement.

The first part of the hardening may be considered over when the hydrogel is first formed. At this stage cement pastes or cement mortars have surrounded the grains of cement or sand with the colorless gluey substance, which also contains small cavities filed with saturated lime solution. Fig. 1 indicates this. A, B, and C are particles of cement ir sand, and *a* represents cavities.

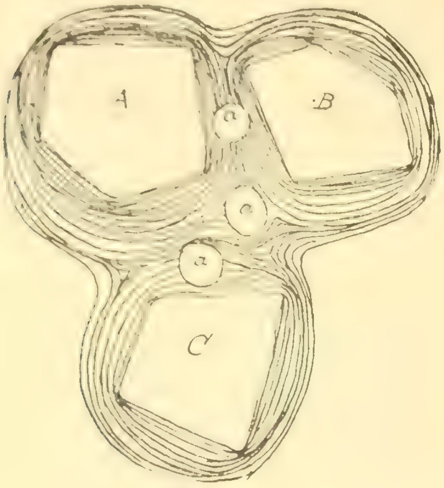


Fig. 1

Cement is composed of more or less fine grains. The above described reactions, naturally, take place first at their surface, advancing from there into the interior. Only about 50 per cent. are hydrated in ordinary Portland cement. The rest consist of particles so large, that the water can only partly penetrate and harden them. The first appearance of the hydrogel, therefore, is not a sign that the setting is over. Instead, the reactions described above continue as long as water can reach the parts not hydrated. Hydrogel, calcium-hydro-aluminate, calcium-hydro-ferrit and hydrate of lime are thus still formed. The necessary water is gotten from the lime solution in the cavities and the gluey mass. The latter acts hereby as a filter, separating the hydrate of lime. This must finally crystallize out, thus filling the space formerly occupied by the water. This is of great importance, as we shall see presently.

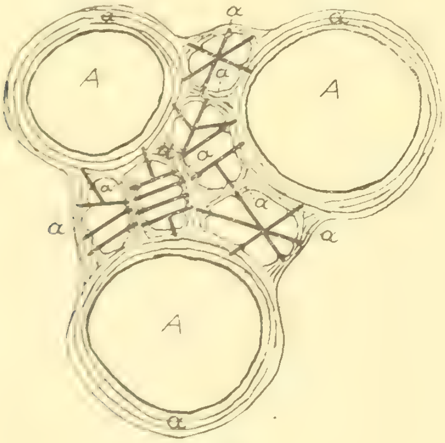


Fig. 2*

The Process of Absorption

The process of absorbing the water by the cement is drying out the hydrogel. The latter is thereby shrinking considerably. This gives it a good grip on the particles it surrounds or is in touch with. At the same time it is also growing stronger. The grains in the mass, therefore, are being tied together firmer and firmer in exactly the same way as if ordinary glue were used. The gluey substance in cement, however, is superior to common glue, in that it is impenetrable for water. Portland cement is on that account waterproof, and the mortars can be made so by careful selection and grading of the materials.

From wha thas been said, it will be seen that the hydraulic properties in Portland cement are due entirely to the hydrogel and not to the hydrate of lime crystals. The "mineral glue," also, is a very important factor as far as the strength of the hardened cement is concerned. It is, however, by no means the only one to be considered. The crystals of hydrate of lime, of calcium-hydro-aluminate and calcium-hydro-ferrit have also their mission to fill. The hydrogel or "cement glue," if I may so call it, shrinks very much, as we have seen. Cavities are then formed. To a certain extent, however, these are filled with the said crystals, especially those of hydrate of lime (see fig. 2), which thus acts in the same way as struts in a trestle, stiffening the structure.

Summary

From what has been said, it will be seen that the cess of Portland cement may be summarized as follows:

The setting depends on chemical and mechanical forces, which dissolve the lime in water, thus changing the same to hydrate of lime. The silica is forced to combine with itself to a certain extent, depending on the nature of the cement. Hydrogel, calcium-hydro-aluminate, calcium-hydro-ferrit are then finally formed. The former is the real cementing ingredient, which, as the process goes on, dries out and then, like a waterproof glue, unites the different particles in the mass. By this time the hydrate of lime has also crystallized out, and together with the crystals of calcium-hydro-aluminate and calcium-hydro-ferrit, adds to the strength of the hardened Portland cement.

Labor Matters at Toronto

At the time of going to press, the builders' laborers at Toronto have practically declared a strike for June 1st. Their terms are a minimum wage of 28 cents an hour, with a recognition of the union. About 1,500 builders' laborers are employed in the city. Nearly 1,200 of these belong to the union.

The painters' strike is declared off. It is understood that the prevailing wage will be 35 cents an hour, although no agreement has been signed to that effect.

Mr. J. E. Beauchemin, a well known contractor of Sorel, Que., died last week, aged 69 years. Mr. Beauchemin was formerly city engineer of Sorel. His death resulted from congestion of the lungs, contracted while supervising the construction of government wharves at Sorel.

Building permits issued at Vancouver, B.C., since the first of the year total five and a half millions.

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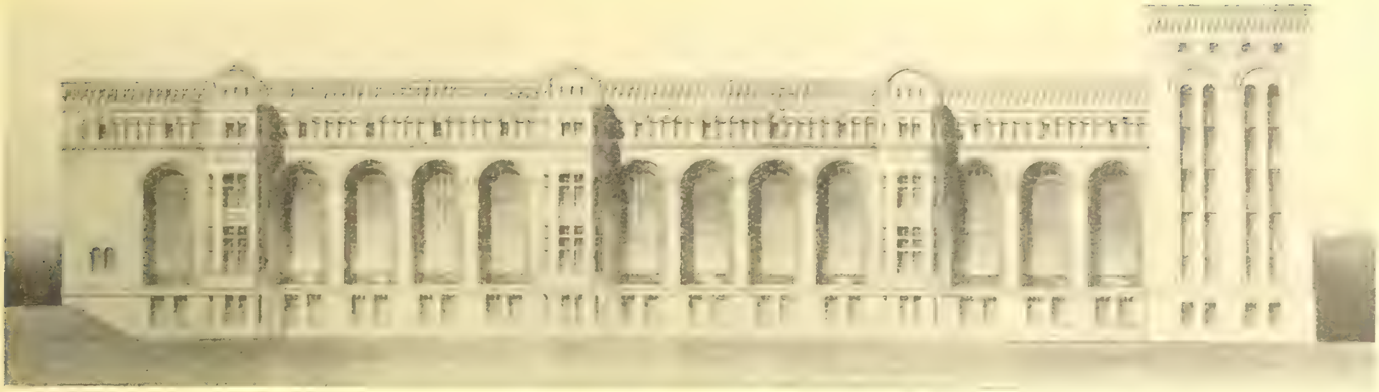
*A, Grains of sand; a, cells, walls of dry hydrogel. The thin lines indicate crystals of lime hydrate.



West Elevation, Museum Building, University of Toronto—Architects: Darling & Pearson.

Museum Building, University of Toronto

One of the most interesting building projects now under way at Toronto is the new Museum Building for the University of Toronto. At present the authorities of the institution are carrying out only that portion of the scheme shown in the above illustration, which represents less than a fourth part of the total undertaking. When completed the new Museum Building will be a valuable acquisition to the University and will rank as one of the finest educational buildings of its kind on the continent. The dimensions of the west wing shown above will be 400 feet by 66 feet. The building will be four storeys high, of brick construction, with stone trimmings.

The tenders submitted in this connection indicated keen rivalry on the part of the contractors. The successful bidders for the mason work were Messrs. R. Robertson & Sons, masonry and general contractors, Toronto. This firm has already executed a considerable amount of creditable work for the University. Among the structures they have built may be mentioned the Convocation Hall, Thermo-Dynamics Building, Physics Building, Chemistry Building, Gymnasium, Residences, Observatory, Forestry Building, and, most recent of all, a large addition to the Library.

Winnipeg's Municipal Asphalt Plant

Winnipeg has a municipal asphalt plant, established in 1899 at a cost of $14,000. The first asphalt was laid in 1897 by contract—7,314 square yards, at $2.35 per square yard, Trinidad lake asphalt being stipulated. In October, 1898, tenders were asked for paving 17,801 yards on Portage avenue, one of the city's principal thoroughfares. About that time the civic authorities deemed it desirable to establish a municipal plant, and the plant of the local company was purchased.

Experimenting showed that the best mixture for wearing surface of an asphalt pavement was 10 to 12 per cent. bitumen; 78 to 85 per cent. sand, and 5 to 10 per cent. pulverized limestone. The various kinds of asphalt used have been Ventura, Alcatraz (small quantity), Obispo, Acme, Los Angeles. Trinidad Lake, Trinidad Land, Venezuela, and Bermudez. Trinidad Land, it is said, was found to be the least satisfactory. The asphalt for 1907-8 was bought from Venezuela, for 1909 from Mexico.

The preparation for an asphalt pavement in Winnipeg is thoroughly made. The street is excavated 11 inches. Soft and spongy places are dug out and refilled with good earth, well rammed. Curbing is laid on grades and lines given by the engineer in trenches of the required depth, filled with broken, coarse, macadam stone. Upon the subgrade is laid a bed of Portland cement concrete 4½ inches thick, made by first mixing dry and then making into a mortar, one measure of cement equal to the best quality of Portland cement and three of sharp, clean sand. The binder course consists of broken stone and asphaltic cement, about 15 gallons of cement to 1 cubic yard of stone, the stone broken to ¾-inch. The stone is heated by passing it through revolving heaters, and thoroughly mixed with the asphaltic cement.

The average cost of paving the streets of Winnipeg with asphalt is about $2.30 per square yard. There are 58 miles of asphalt-paved streets in the city. During 1908 and 1909 extensive paving operations necessitated the maintenance of 125 men at the plant and 75 men on the street during the busy season. Conditions in Winnipeg are a particularly severe test of asphalt pavements; but, notwithstanding this, the cracks made by frost and disintegrations from other causes are few and small, and rarely show on the surface.

An Important C.P.R. Contract

One of the largest contracts of the kind ever awarded in this section was that for the extension of the Canadian Pacific Railway Company's irrigation system into the eastern section of the irrigation block in the Province of Alberta. This contract calls for the moving of some 28,000,000 cubic yards of earth. The contract price was about $5,230,000, which was practically $250,000 under the company's estimate. The work is to be started at once and is to be completed in five years. The system will provide for the irrigation of some 540,000 acres and will require a reservoir with a storage capacity of 300,000 acre feet. The successful bidder for the work was James McDonnell & Company, with whom are associated Winter, Boomer & Hughes and Grant Smith & Company, all of Spokane, Wash.

Business Openings in Western Canada

The Land Department of the C.P.R. at Winnipeg, Man., has entered upon the publication of a breezy little booklet, entitled, "Western Progress." As implied by the name, "Western Progress" is devoted to setting forth the advantages of western Canada and to helping those interested in this field. Among the business openings mentioned in this number are the following: Asquith, Sask., brick plant and rural telephones; Cowley, Alta., lighting plant; Chin, Alta., lumber yard; Dubuc, Sask., brick plant; Govan, Sask., sash and door factory, brick plant; Rouleau, Sask., light and water company; Redvers, Sask., light, water and telephone plant; Swift Current, Sask., brick plant.

Purification of Public Water Supplies

An Interesting Resume of Recent Developements in this Field—Selection of Method should be Governed Mainly by Local Conditions[†]

By R. S. Lea

Recent practice in slow sand filter design does not show much variation from the old. The excessive depths of sand and gravel, particularly of the latter, common in many of the earlier filters now, seldom exceeds four feet, and much greater uniformity is apparent in this respect. More attention is given to the grade of sand used, and in general a sand of lower "uniformity coefficient" is now called for. The maximum loss of head provided for in many modern plants is much greater than previously allowed.

Probably the most notable advance of recent years in connection with slow sand filters has been the introduction of much improved machinery and methods for washing and preparing filter sand and for handling it cheaply.

The earlier method consisted in scraping the bed and removing the sand by manual labor; crude appliances were used for washing.

As a result of these improved appliances for handling and washing sand it is now possible to secure a much better grade of filter sand in localities where it does not naturally exist, while the cost of cleaning filters has been reduced in some instances from two and three dollars to 50 and 60 cents per million gallons filtered. This reduction in operating charges has been accompanied by some economy in first cost effected by keeping the total depth of the basin, that is, of filtering medium and head room, within reasonable minimum limits. The recently constructed Queen Lane filters at Philadelphia present a novel feature from the point of view of economy of space required. In this plant the filters are placed over the clear water basin, the floors forming the roof of the latter. The applied water is here subjected to preliminary filtration; which has permitted the adoption in the final filters of a sand layer, only 20 inches deep, covering 16 inches of gravel.

Mechanical Filters*

About the year 1884 the late J. W. Hyatt patented a process for the purification of water known to the present day as Mechanical Filtration. The essential feature of this system as distinctive from its forerunner, the continuous or English method, is in the use of some soluble chemical salt as alum, sulphate of iron, but usually sulphate of alumina, to coagulate the raw water before reaching the sand filters. The subdrains were so arranged and connected that the beds could be washed quickly and easily by a reverse current of water aided by appliances for stirring the sand.

By coagulation is meant the formation of an inorganic precipitate in the water, the presence of which has a physical action on suspended matters, facilitating their removal by subsidence or filtration; where sulphate of alumina is used, the chemical reactions result in the formation of hydrate of alumina, an insoluble gelatinous compound of greater specific gravity than the matters in suspension, which along with the bacteria, it draws together and surrounds, forming a flaky precipitate in the settling basin, and to a lesser degree on the surface of the filter beds, where this spread of entangled suspended impurities, adhering to the sand grains, has through its absorption of dissolved organic matter, a marked effect in reducing the color, and accomplishing the chemical purification of the water, besides increasing the efficiency of the straining action of the filter, by offering to the flowing treated water a closer and more compact surface.

It is to be noted that the complete decomposition of the alumina salt will only take place in the presence of an excess of calcium carbonate, and in the absence of sufficient natural alkalinity it must be artificially added to the raw water by the introduction of some such alkali as soda ash. The effect of this treatment on the water is a slight change in the nature of the lime salts, owing to an increase in the proportion of sulphate of lime, while the carbonate acid displaced, passes off or is absorbed by the water.

There are two varieties of mechanical filters, known as gravity and pressure filters. In the latter the filtering medium and the drainage system are placed in an enclosed steel tank, through which the water is forced under pressure, directly from its source, to the mains, and thus it has the distinct advantage that it can be easily connected into existing systems without requiring additional pumping machinery. It is a cheap installation, and has been extensively used for industrial plants requiring a clear water. It is further claimed to give good results in the treatment of domestic supplies, which it probably does under favorable conditions; but for obvious reasons it cannot be expected to compare in efficiency with gravity or open filters. The open wooden tank contains the filter sand overlying a subdrainage system through which the water passes to a rate controller. When clogged the filter is quickly and easily cleaned by a reverse flow of water under pressure overflowing to waste above the beds. This washing is accompanied or preceded by a loosening of the bed through the operation of mechanical agitators. The coagulent was mixed with the raw water in advance of its admission to the bed with more or less preliminary sedimentation.

These filters met with some success in the decade that followed their introduction, and quite a number of small plants were installed. The conditions of successful operation were not, however, clearly understood at that time and, consequently, while some of these earlier installations undoubtedly gave good service, there were many instances of failure to accomplish desired results. In 1895, experiments were commenced at Louisville with the excessively turbid water of the Ohio river; where at times the clay in suspension is in a very finely divided state, smaller even than the bacteria. The tests here carried out served to show the inadequacy of slow sand filtration when applied to such a water, the physical characteristics of which, like many American waters, presented a problem in water purification which had not been encountered to any extent in European practice.

The next five years witnessed a great development in the process of mechanical filtration; in fact, the scientific basis for the working of this system may be said to date from the inception of these investigations. It was only another example of "necessity being the mother of invention." Experiments were later undertaken by Pittsburg, Cincinnati and other interested corporations. A free interchange of experiences soon resulted in the development of methods of treatment capable of purifying a great range of waters. The mechanical filters installed since that time show a marked improvement over the earlier plants. Better appliances for the application and control of the chemical were devised. The importance of regulating the period of coagulation to suit the condition of the raw water was now understood, and led in many cases to the use of larger coagulation basins to allow the chemical changes to become complete before the water passed to the filters.

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* Type proposed for Montreal Water & Power Co.'s Plant.

[†] Extracted from paper read before the General Section of the Canadian Society of Civil Engineers.

The Part of Oxidizing Agents

As has been already stated, no material change has taken place during the last decade in the established methods of filtration. The past 18 months, however, has witnessed what promises to merit recognition as a very decided advance in the science of water purification. This advance may be described as a demonstration of the feasibility of accomplishing the bacterial purification of water at a low cost by treatment with an oxidizing agent, and in such small quantities as to eliminate any apparent risk incidental to its reaction.

Although several oxidizing agents had been previously experimented with or used as temporary expedients for this purpose, it was not until after the disinfecting plant of the East Jersey Water Company was put into commission in September, 1908, that the actual capabilities of the process were fully appreciated and understood. The oxidizing agent here used was chloride of lime or "bleach." The theory of the process is as follows: when added to the water the bleach splits up into the inert calcium chloride and calcium hypochlorite; the hypochlorite, when acted upon by the carbonic acid in the water, forms calcium carbonate and the oxidizing agent, hypochlorous acide; in the presence of oxidizable matter the oxygen of this compound is released, leaving hydrochloric acid, which displaces the carbonic acid of the carbonates forming an inert chloride, while the atomic oxygen, which is the agent that actually does the work, and accomplishes the bacterial purification, combines with any oxidizable organic matter present. Its effects are said to be practically instantaneous. The treatment removes the color slightly, but not materially, and does not affect suspended matter except the bacteria. From the point of view of bacterial purification, the results obtained in Jersey City, using only five pounds of bleach per million gallons of water treated, would rank this process with the best filtration plant now in operation. To quote from a report of Dr. Leal, who recommended this treatment: "For weeks at a time the water taken three-fourths of a mile below the works has been practically sterile, and the count at Jersey City has been from sterile to an average of 20 or 30 per c.c. with bacillus coli present in 10 c.c. only three times up to April 27th, 1909. The bacteria in the raw water has been from 300 to 20,000 per c.c. with B. Coli frequently present in one-tenth c.c."

Litigation which followed the use of "hypochlorite" in the Jersey City supply, brought the process prominently to public notice, and the bleach treatment has consequently been later applied for purposes of bacterial purification to several large water supplies. The uniform success which has attended its use under varying conditions with respect to the character of the raw water and to the nature of associated purification processes, is really remarkable when we consider that in its application as an adjunct to water filtration it has scarcely passed the experimental stage.

At Nashville, Tenn., a highly turbid river water has been satisfactorily clarified and has shown over 95 per cent. removal of bacteria, by the combined application of sulphate of alumina and bleach, without subsequent filtration. 14,000,000 gallons per day have been there treated in this way since August, 1909.

Success of Hypochlorite Treatment

At about this same time the hypochlorite treatment was introduced at Harrisburg, Pa., in connection with their mechanical filtration plant. The supply from the Susquehanna river had proved a difficult water to secure good results with at all times, owing to great variation in the color, turbidity, and other characteristics of the water. The use of 10 pounds or less of hypochlorite per 1,000,000 gallons has effected a marked improvement in the uniformity of the bacterial purification, besides permitting the reduction of coagulant to only such quantities as are necessary to remove color and turbidity. The operation of the plant under the combined treatment continues to give the best of satisfaction, as shown by a recent statement of the superintendent of the plant: "The operation of our plant during the months of January and February (1910), ordinarily the worst months of the year, has been made easier; and the results bacterially and in the quantity of chemicals used, are remarkable. The bacteria in the river water averaged 23,117 per c.c., and in the filtered water only 6 in January, while in February the river water contained 9,015 and the filtered 3 bacteria per c.c., both remarkable averages when it is considered that these months are the ones when all the shortcomings of mechanical filters are present."

The use of hypochlorite with the otherwise untreated supplies of Minneapolis, Toronto, Montreal, and Montreal municipalities, as an emergency measure, afforded relief from threatened typhoid epidemics during the past winter. Probably in no instance has the value of "disinfection" as an adjunct to established processes of water filtration been more conspicuously shown than at Poughkeepsie, N.Y. To this city belongs the distinction of building and operating the first filter plant on the continent; in 1896 and in 1905 the works were improved and enlarged, nevertheless it was found expedient to construct a sedimentation basin for preliminary treatment of the water with a coagulant after the manner of mechanical filters. This method of treatment gave good results with the Hudson river water during its turbid stages. The severe drought during the summer of 1908 added to the pollution of the Hudson river supply by concentration in the reduced flow of the river, and in the absence of any turbidity in the raw water, no results were obtained from coagulation and sedimentation. The plant, operating as a slow sand filter, failed to produce a safe effluent. Under these circumstances, which represent in a sense an example of the inability of both types of filters to handle the water, the hypochlorite treatment introduced on February 12th, 1909, has so far overcome the difficulties previously experienced with this plant, and, to quote from a paper by Dr. Otis (Journal New, E.W.W., September, 1909), "they believe that when used in quantities from 8 pounds to 10 pounds per 1,000,000 gallons, it will reduce the bacteria over 99 per cent., and will practically eliminate the B. Coli and presumably the typhoid germs." The bleach used in the cases cited contained about 35 per cent. of available chlorine, and was applied in very small quantities, ranging from five to ten pounds per million gallons. In almost every instance the treated water has shown a bacterial count of an order that is hard to maintain in the effluent from the best filters of either type in practical operation. The cost of the treatment is merely nominal. Fifteen cents to thirty cents per million United States gallons covers the cost of chemicals and operation.

While the value of the "bleach" or any other oxidizing agent as a treatment for water in cases of emergencies, is duly recognized, it is perhaps too early to predict to what degree disinfection will be productive of economy and efficiency in the science of water purification. As a complete treatment in itself, it is applicable to only a special class of waters, but results from its use to date, point strongly to the conclusion that as an adjunct to both types of filters it will permit of the adoption of higher rates and possibly less reserve area with a corresponding reduction in first cost. This would appear to be particularly the case where the rate is governed by the degree of bacterial purification required rather than the physical improvement of the water.

Economy and Certainty of Disinfectants

In the judgment of those who from their experience are best qualified to pronounce on the matter, it is believed that from the point of view of economy and certainty of operation, the use of disinfectants will give the best results as compared to filters of the mechanical type. Over [illegible] experiments were undertaken at Lawrence, Mass., on the Merrimac river water by mechanical filters, using sulphate of alumina as a coagulant, and bleach as a disinfectant. Soda was used when the alkalinity of the water demanded it. The following extract from a paper on these tests is of interest in this connection. "When bleach is used in combination with sulphate of alumina in mechanical filtration, a satisfactory bacterial removal may be obtained at much less expense for chemicals than when sulphate of alumina is used alone. In such a process the disinfection occurs in the coagulation basin before the water reaches the filter and subsequent filtration introduces a factor of safety which greatly adds to the effective purification of the water and greatly reduces the chances of the occasional failure of the process. In the experiments quoted, an effluent of better quality bacterially was obtained by the use of about 0.9 grain sulphate of alumina and about 0.7 grain of soda per gallon in combination with bleaching powder equivalent to 0.11 part per 100,000 available chlorine, than when nearly double the amounts of sulphate of alumina and soda were used without disinfectant."

The first cost of purification plants will depend primarily on the quality of the water to be dealt with. When the appropriate method of purification has been decided upon the cost will depend for each case on the price of materials and the local conditions which usually affect the cost of engineering works. Manifestly, then, it is impossible to make any statement as to cost which would be generally applicable; but, speaking broadly, it may be said that for plants of from one to four or five million gallons per day capacity, the first cost will range from $15,000 to $30,000 per million gallons for filtration alone. In some cases where the circumstances are unusual, the cost may be higher than this. For large plants the cost will range from $12,000 to $25,000 per million gallons. As has been stated above, each case should be separately studied so that both economy and efficiency may be advantageously combined. Generally speaking, what have been referred to as mechanical filtration plants will cost less to install than slow sand filters; but with a water which can be handled by either system, the reverse is usually the case, when the initial, operating, and maintenance costs are jointly considered.

It may be said that with present methods of purification the total cost, including interest, sinking fund, operation and maintenance for treating water of average turbidity, will not often be greater than one cent per thousand gallons of water purified. This means that for a consumption of 100 gallons per capita per day the cost to each consumer will be less than 40 cents per year.

Relative Merits of Slow Sand and Mechanical Filters

It may not be out of place to add a word concerning the relative merits of slow sand and mechanical filters. It is a question that has received considerable unprofitable and not entirely disinterested and fair discussion; as a result, both systems have been the subject of some unmerited claims and much unjustifiable criticism.

Such a controversy is neither necessary nor desirable; the two systems do not, in fact, admit of a rational comparison in the abstract. Both are wonderfully efficient machines in the accomplishment of the work legitimately required of them; and the varying conditions encountered in the field of water purification presents a variety of problems in the solution of which both systems are a necessity.

The distinguishing feature of mechanical filtration does not commend this system to the popular mind, which is disposed to regard with suspicion the use of a chemical in a drinking water; to those who hold strong convictions on this subject, it may be well to point out that after twenty years of experience, the indictment against coagulants with respect to effects prejudicial to the potability of the water, has never yet taken any more definite form than a suspicion.

Coagulants are, moreover, a necessity in the efficient and economical treatment of many turbid and highly colored supplies.

The waters to which slow sand filters are inapplicable as a complete treatment are the most costly to handle, and the cost of operations of systems using a coagulant, considered as a class, is naturally higher than in the case of slow sand filters.

The installation of rapid coarse grained filters for preliminary treatment has permitted the adoption of final filters of the slow sand type in some recently constructed plants; these preliminary filters, known as "roughing filters," effect the clarification of the water in some cases as at Philadelphia, without the aid of coagulants. A description of some of the largest plants recently put in operation on this continent has lately appeared in the daily press; and it has no doubt been noted with regard to these plants, that scarcely any two of them follow the same course of treatment; this is perhaps one of the reasons why all are giving such splendid results. Novel features and methods have been introduced to meet varying conditions arising from the characteristics of the raw water, the availability of space and structural material, and any peculiar circumstances anticipated in the operation of the plants.

The success of these installations from the point of view of both economy and efficiency, is in no small measure to be attributed to the thoroughness of preliminary investigations.

Study Carefully Local Conditions Before Choosing Method

An interesting and remarkable example of the value of careful study of local conditions, in advance of the selection of a method for the purification of a water supply, is to be found in the small plant put in operation in September, 1908, for the treatment of the Susquehanna river water at Steelton, Pa.

Here the designer had the benefit of an experience gained in the design and operation of the Harrisburg filters on the same river. Some idea of the difficulties presented may be gathered from the following description given of the river water at Steelton:

"High bacterial counts sometimes accompany very low, as well as very high, turbidities, and similarly relatively low turbidities are sometimes found at the very high stages of the river; further, the color of the turbidity is no indication of its total amount, as a comparison of the records of ten samples of water, each with a turbidity of one thousand parts per million, collected at different times, and at different parts of the river, shows all gradations of colors between bright yellow, red, dark brown, and black. As a result of these complex conditions, the water in the river may change quickly from a moderately hard, clear water to a soft water carrying several thousand parts per million of turbidity, which, on occasions, may intermittently come down coagulated to a more or less limy or flocculent condition with hydrated oxide or iron and hydrate of alumina. On the other hand, the river from bank to bank may be carrying its maximum load of yellow clay from the Conodoguinet and Juniata, or reddish brown mud from the west branch. During a general flood from the entire watershed, all these conditions may prevail at the same time.

The plant here installed has a nominal capacity of 3,000,000 gallons per day; and consists of preliminary coarse grained filters working at a rate of 170,000,000 gallons per acre per day. These filters are operated both as simple roughing filters and also as mechanical filters, using a coagulent when it is found necessary to produce an effluent which can be handled by final filters of the slow sand type.

As a result of careful control of the preliminary filters, it is estimated that the final filters will have a capacity of 9,000,000 gallons per acre per day.

This plant has been most efficient in accomplishing the bacterial and physical improvement of the water.

The initial cost, exclusive of exterior conduits, was less than $60,000, that is, about $20,000 per million gallons estimated capacity. The cost of operation is in the vicinity of $3 per million gallons, so that, placing interest and depreciation at 10 per cent. on the cost of the plant, it will be seen that the total cost is within $10 per million gallons filtered.

This is a remarkable performance under such unusual circumstances, and the moral points forcibly to the expediency of giving ample opportunities and facilities for familiarizing themselves with all local conditions.

Conclusion

It will not be necessary to refer in detail to the many advantages possessed by filtered water when used for drinking and other domestic purposes. One of the most serious and at the same time unnecessary diseases which affect humanity is typhoid fever. This is a disease of the human intestines, and is now generally admitted to be caused only by the specific germ of typhoid, the typhoid bacillus. This germ is found in enormous numbers in the urine and feces of persons afflicted with typhoid fever. Hence it is that sewage is at all times liable to contain large numbers of these germs, and is of all impurities in water the one most to be feared. The water courses of a country, the rivers and streams, are the natural drainage channels, and it is, therefore, practically impossible, when their watersheds are inhabited, to prevent sewage in some form or other from entering them; so that it may be generally stated that, except for the smaller streams whose watersheds may be thoroughly protected, no river water is safe to drink without purification. This statement must, of course, be greatly modified as to degree. Large streams and sparsely inhabited watersheds constitute safer conditions because of a high dilution; but the universal and constant use of water demands that its purity should be jealously guarded at all times and under all circumstances. If, for example, it was known that a public water supply was rarely liable to contain a poisonous substance like lead, in such quantities as to be sufficient to cause serious disease and sometimes death, there would be no hesitation in condemning it. Rivers flowing through populous districts will always receive a certain proportion of sewage which will occasionally contain that which will cause disease and death just as surely as if they were contaminated with a deadly poison in some other form. We do not need examinations of the water to tell us this. As a matter of fact no analysis has as yet been able to furnish positive evidence of infection. In all the thousands of sanitary analyses of water which have been made the typhoid bacillus has been identified less than a dozen times, so that a favorable analysis of a surface water is no guarantee as to its safety for drinking purposes.

The important fact is that rivers have other uses than furnishing supplies of drinking water, and even if all our sewerage systems were equipped with efficient disposal plants, which they are not now, and will not be for a long time, there are still many ways that impurities may enter. Fortunately the tendency is for typhoid germs to die rapidly in water; but the hardy forms at least, which are probably the dangerous ones, can live in river water for days.

Typhoid can be transmitted by other media than water, but a large proportion of the deaths from this disease is caused by water-borne germs, as is shown by the records of places whose water supplies have been improved either by filtration or the substitution of a purer source; and also by a comparison of the typhoid death rates of different cities with supplies of varying degrees of purity. An illustration of this is given by the typhoid rate of Jersey City, which, under the change to a purer supply, decreased from 84 deaths per 100,000 in 1896 to 10 in 1908.

It is now considered that with purification plants properly designed and operated the typhoid rate should be kept down to from 15 to 20 per 100,000, and probably in many cases to less than this. The water supply of Montreal is taken from a large river where the dilution is unusually great, yet the average typhoid fever rate for the last 30 years has been over 40; and for the last ten years about 35. Probably half of these might have been prevented by properly purifying the water. This means, on the basis of the population of Greater Montreal, the prevention of 100 deaths a year, and at least 1,000 other cases. Last year 40 lives were lost in the whole Dominion by accidents at railway crossings, towards the prevention of which the Federal Government is itself devoting $200,000 per year for the next five years. Probably from two to three times as many lives are lost by typhoid fever in the city of Montreal alone.

From a financial standpoint, the average value of a human life is generally given by statisticians as $5,000, which will give some idea of the actual preventable loss to the community from this disease alone, particularly when we remember that the victims of typhoid fever are largely of the age when their life value is greatest. Considering, however, only the cases which recover, with the loss of time and incidental expense, we would probably be underestimating the average cost as at least $100 per patient. This in itself means a loss of $100,000 a year to this community, which somebody has to pay for. But it is from the point of view of the individual that the cost of placing water beyond suspicion appears in its real relation to the results obtained. When the facts of the case are clearly realized no one would risk his health or life, or those of the members of his family, for the sake of an expenditure of less than one cent per week, and this will cover the entire cost of purifying most water supplies.

Cost of Sewage Disposal

In a recent report to the city of Rochester, Mr. Emil Kuichling has collected some data concerning the cost of sewage disposal by different methods and in different cities. He states that in Worcester, Mass., during the six years of 1900 to 1905, inclusive, the average annual cost of operating the sand filter beds varied from $6.79 to $13.12, with a mean of about $8.50 per million gallons of sewage filtered. This is operating expenses only, and does not include interest and taxes on the cost of land and construction of beds. This cost in 1905 had amounted to $176,240, or at the rate of $4,900 per acre, for the whole 36 acres. Assuming interest and taxes at 5 per cent. and taking the amount of sewage treated at 1,029,000,000 gallons, the amount for 1905, the fixed charge was found to amount to $8.56 per million gallons, making the total cost about $17 per million gallons. (This sewage has been previously clarified.)

The cost of chemical precipitation of sewage and disposal of the resulting sludge at Worcester was $11.89 per million gallons in 1905. At Providence, R.I., it was $6.60 in 1906. These figures are the operating expenses only. These two works are the largest of their kind in the United States. Providence discharges the effluent into a large tidal bay, while Worcester's effluent receives only slight dilution in a small stream, which probably accounts for the difference in cost of treatment. The average fixed charges for these would probably approximate $5.75, making the total cost (the average of the two plants) about $15 per million gallons.

For the cost of disposal by sprinkling filters he takes the figures of the Columbus, Ohio, plant, in which the cost of the beds, gate house and piping immediately connected with the filters was about $150,000 for ten acres, or about $7,500 per million gallons treated. Including the large sedimentation tanks and the land, and the two small settling basins for clarifying the effluent, the tota lcost was about $193,100, or about $21,655 per million gallons treated per day. If interest, depreciation and taxes on this be taken at 6 per cent. this will amount to $4.05 per million gallons treated. Concerning operating expenses he states that no data are yet available, but that this probably will not exceed $2 per million gallons, which would be increased by about $3 if the sludge had to be disposed of in some more expensive way than by discharging into the river during flood, making the total cost about $9 per million gallons treated.

Based on these and other data and on preliminary designs for treating the sewage of Rochester in various ways, Mr. Kuichling estimates that the cost per million gallons of sewage treated would be represented by the following figures, both operating and fixed expenses being included in each case:

(a) Clarification by grit chambers and fine screens, 55 cents per million gallons.

(b) Intermittent filtration of screened sewage, as supplementary to (a), $16.92 per million gallons.

(c) Chemical precipitation, including coarse screening, $14.88.

(d) Sprinkling filters preceded by coarse screening and sedimentation tanks, $9.03 per million gallons.

(e) Plain sedimentation of the effluent from (a), $1.05 in addition to the cost of (a).

(f) Sewage farming. No estimate was made of this.

(g) Disinfection of effluent from (a) by ozone, $10 additional.

(h) Disinfection of effluent from (a) by chlorine, at 25 parts available chlorine per million, $10 additional.

(i) Same as (h), but with only 10 parts available chlorine per million, $3.75 additional.

(j) Disinfection of effluent from (a) and sedimentation tanks with chlorine at the rate of 6 parts available chlorine per million, $2.42 additional.

These estimates, especially those for filtration and chemical precipitation, may seem excessive to many who are unfamiliar with the details of sewage filtration, but we believe they are no more than conservatively high, on the assumption that as high a degree of purification is being obtained as is consistent with the method used.

Street Paving in London, Eng.

In the borough of Hampstead there are now about nine miles of wood-paved streets, those sustaining the heaviest traffic being paved with Australian hardwood sectional block, which, including concrete foundation, costs about $3.40 per superficial yard. On roads where traffic is not so heavy, creosoted Baltic timber blocks are used, the cost of concrete foundation being about $2.68 per yard. The average life of the wood paving in Hampstead is about ten years, and the borough engineer states it has given general satisfaction, as the road gradients in that section vary considerably and wood paving gives excellent foothold for horses on gradients up to 1 in 20.

There are about 15 miles of wood-block roads in the populous borough of St. Marylebone. In the construction of these roads the macadam or other previous paving material is excavated, the ground properly graded, a 6 to 9-inch Portland cement concrete foundation put down with a perfectly smooth surface, and when thoroughly set, paved over with creosoted deal blocks 5 inches deep, grouted with bituminous composition. The average life of this paving is 10 to 15 years, according to the amount and nature of traffic. The cost per square yard is $3.28 for 5-inch creosoted deal blocks placed on an 8-inch concrete foundation. The borough engineer states that this paving is very advantageous because it is comparatively noiseless, much more economical to structurally maintain than macadam, and affords a fair foothold for horses, but, owing to its smooth surface and impervious nature, requires more cleaning than macadam.

In our issue of May 4th we inadvertently omitted to credit the "Engineering Review" for the article relating to a piping system for steam heating.

Some Causes of Leaky Slate Roofs and their Remedies

A writer who has had an experience of many years chiefly in connection with slated roofs, describes some of the causes of roofs leaking and points out remedies for the trouble in a recent issue of our London contemporary, "The Illustrated Carpenter and Builder." He intimates that there are few, if any, roofs that do not at some time or another allow water to enter the interior of a building, staining the ceiling and doing other damage. He states that the two leading principles in connection with roof work are the pitch of the roof and the mode of covering it. He points out that the flatter the pitch, the larger the slates and proportionately increase of lap, while the steeper the pitch the smaller the slates and less the lap. What he further says on the subject is of such general interest that we present it herewith.

On more than one occasion when the writer has had to repair a roof that looked perfectly sound, he has been told by the tenant that the leak appeared only after very heavy rains, and on removing a few slates over the defective part he has not found any broken or cracked slates to cause the leak. In other words, the roof is flat pitched, the slates are small, and the lap insufficient.

To remedy the defect, and where appearance is no object, an easy way out of the difficulty, and one that does not involve stripping the roof, is as follows: Remove about a dozen slates centrally over the spot where the rain has soaked through. If the existing slates are 16-inch by 8-inch or 20-inch by 10-inch, procure some larger slates, trim down to the same width as existing slates, but not the length, so that the extra length will give an extra lap to that portion of the roof affected. If, however, through weakness of roof timbers, a part of the roof has become concave on the surface, the rafters should be firred up and the slates refixed.

Another and very frequent cause of leakage is where the roof abuts against the walls. It should be remembered that a great safeguard against leakage at this point is the insertion of a tilting fillet at the time of constructing the roof previous to covering in. It helps to keep the rain from percolating beneath the slates or flashings. The tilting fillets, though very essential, are in a good many cases omitted. They should be fixed at the junctions of walls and roofs as well as at the undereaves. There can be little doubt that flashings make the best finish at these points. Cement fillets do not, generally speaking, last long. The vibration of the roof in stormy weather causes the cement to become detached from the slates, leaving a gap for rain to enter, as the fillet has a better key and adheres firmer to the brickwork than the smooth slates. It would be better for the fillet to be oblong rather than angular in section, so that the greater part is on the roof. Were the fillet composed of lime and hair gauged with cement, it would be an advantage over the usual cement and sand.

The bond of slating should be regular throughout, as any variation has a tendency to allow rain to enter the roof, especially during heavy storms.

In order to economize slates, sometimes the undereaves are composed of small pieces of slates just sufficient to break the joint, etc., but this should not be allowed. Rain falling on a roof increases in volume as it gets nearer the gutters, and consequently the undereaves course should be composed of full width slates as well as any other part of the roof, for if not so constructed it is liable to allow the rain to find its way to the interior of the building.

A good sound slated roof requires:

(a) Tilting fillets at gutters and at junction of walls.

(b) No cement fillets but proper flashings wedged and pointed to the brickwork or stonework.

(c) The bond properly kept throughout.

(d) The lap regulated according to the pitch of the roof.

The Installation of Contractors' Plants

Value of Detailed Records Showing Cost, Arrangement and Condition of Machinery — Installation of Plant an Important Consideration

By Daniel J. Hauer

In cost records a great many important features are frequently ignored. This is especially so in regard to the great item of plant or outfit. We can find few records giving detailed costs, the exact arrangement of the plant used, the great item of repairs and renewals, and whether or not the plant installed was in constant use.

Such charges are frequently put down as a certain per cent. of the total cost of the work, or as a general or fixed charge in the cost of construction. It is really one of the most difficult things for every contractor and engineer to handle. The charge can be a varying one, according to the methods used. The size of the gang, likewise, can affect the plant charge, also the condition of the labor market. If wages are high and men scarce, it is often necessary to have a larger plant than when men are anxious to secure work.

Records of plant charges, broken up into its various details, are very scarce. For instance, but little data can be obtained on the labor cost of the installation of plants. On the installation of cable ways but little is in print. Even in simpler things, as the setting up of a derrick, or even the moving of a derrick, but few records have been published. On some jobs these items alone may mean the consuming of all prospective profits.

The item of plant charge should always include installation. It is true that when the plant is small and the work located close to some railroad station, this item may be an insignificant one, but on extensive jobs, or even small jobs at some distance from a railroad, the item of installation may run into many thousands of dollars. In most cases this cost is nearly always under-estimated by the engineer and contractor.

Plant charges are too frequently guessed at, being estimated, as a rule, as being from five to ten per cent. of the total cost of doing the work. These percentages have evidently been obtained from the few accurate records that have been published. Some large contracting firms have an arbitrary charge for plant, varying with the different classes of machinery used by contractors. In some cases these arbitrary charges are meant only to be used for depreciation on the plant.

On certain classes of work it is absolutely necessary to charge the entire cost of the plant against such work. This is where plant must be of a special design, or where there is absolutely no salvage on the plant at the end of the job. This does not always apply to the entire plant, but frequently to parts of the contractor's optfit or apparatus, he may need This is always so in regard to small tools, such as picks, shovels, wrenches, etc. Such tools should never be charged against the plant or outfit, but should be a direct charge against the expense of the job. Few engineers seem willing to have contractors charge an entire plant against one job, even when there is no salvage to the plant. As a general rule, this should not be done, but, as previously stated, there are cases when it is absolutely necessary to do so if the contractor is to come out whole. In building the new Croton Dam, steel towers were erected to hold the derricks. As the masonry was built up these towers were embedded in the structure. Thus, there could be no salvage on them; and as these towers were apparatus used in constructing the dam, it should be a direct charge against the work. On other large jobs the same things occur; and this is especially so on heavy canal work. Gantry cranes and large steel tower systems are often built to carry on excavation, and there is very little salvage to them after some four or five years' use. Naturally, the cost of installing such special pieces of apparatus is extremely large, and a rough guess on such work will generally mean a decided money loss.

All this shows the great importance of the installation of plant and various apparatus for constructing purposes, especially on large jobs. Even on small contracts this can be important; such as the erection of a derrick for a small box culvert on a railroad. The wasting of a day in setting up and taking down a 30-foot boom derrick may mean the eating up of all the profits on the mason work. This also calls attention to the moving of plant from one part of a job to the other. Records should be kept of this class of work, as well as of the original installation.

Interesting Cases in Point

Last summer a contractor working in the Northwest used scrapers for putting up an embankment of 170,000 cubic yards. He was compelled to carry the plant for this work, consisting of traction engines, scrapers and horses, over rough mountain roads. The cost of moving this plant and installing it on the job, and of taking it away, amounted to 1.2 cents per cubic yard of material handled. This was 9 per cent. of the total cost of doing the work. For carrying such an easily transported outfit across the country and also for interest and depreciation, one would hardly imagine that the plant charge would exceed 5 or 6 per cent. of the total cost of doing the work, but in this case the cost of installation and taking away the plant exceeded this percentage.

In installing a No. 2 gyratory stone crusher, the total costs for labor and transporting were $420. The crusher had to be unloaded from the cars, transported on its own wheels six miles, during the winter time, over rough mountain roads, set up in place, engines set, elevator and screens put in place, and a large bin built. A platform had to be constructed to feed the crusher, and a shed built over the engine and boiler. The cost of installation in this case was 33⅓ per cent. of the cost of the crusher. This machine, from this one set up, had to crush about 3,000 cubic yards of rock.

In moving a steam shovel 5½ miles through the mountains, in some cases the grades being very steep, varying from 3 to 15 per cent., several snowstorms occurring during the progress of the work, the cost amounted to about $4,300, inclusive of raising the boom and setting the jack arms in place. The work was done under adverse conditions, and the cost of moving the boom, alone, was about $1,000. The shovel was a 70-ton Bucyrus. Contrast this with putting a shovel of about the same size to work on a cut alongside of a railroad track. Here the track was cut, a switch put in, boom erected and jack arms placed, for a little less than $100.

Upon another occasion the writer had a large shovel, just before being put to work, to fall over. This shovel was picked up by means of locomotives and hydraulic jacks, a few parts repaired and the shovel put to work, the total cost being a little less than $1,000. Upon another occasoin a Model 20 Marion shovel was taken apart, hauled [illegible] miles over rough mountain roads, and assembled again at a cost of about $2,500. One item, though, that cannot be set down in this case, is the great amount of time consumed in dismantling the shovel, hauling it, and putting it together again. As the job had to be done quickly, this delay was an important item.

In moving two donkeys a distance of [illegible] miles over a mountain road the cost was $600. It is of interest to note that one dinkey cost $400 to move, while the second one cost but $200, the difference being, to a great extent, due to weather conditions, and the fact that in moving the first one the gang of men became familiar with the road and the difficulties that had to be overcome to prevent accident.

Even small dump cars are sometimes expensive to move and to place on the job. Four-yard cars have cost the writer $11 per car to haul 5½ miles and place them on the track.

Installing the Plant

Installation of plant is often done in a haphazard manner. The job being new, tends to make confusion, and the forces are often inadequate. Trained men for moving and installing plant cannot always be obtained, and frequently the contractor has not the time to give the necessary thought to plan his work. The installation of the contractor's plant can be likened, to a great extent, to that of a factory. Every manufacturer has been made to realize that the cost of installing the machinery has to be kept down, and much thought has to be given to the placing of his machinery. Output always depends upon the arrangement of the plant. Contractors should plan their work well ahead, as not only will the cost of installation thus be kept down, but much money can also be saved in carrying on the work. Wherever possible, drawings should be made and instructions for doing the work be written out, as in this manner many mistakes can be eliminated. Then, too, the pitfalls encountered on previous jobs can be recorded and the plans changed to overcome such difficulties. Every contractor should have kept close costs on the installation of machines, and, in connection with such costs, there should be diagrams showing the location of various parts of his plant, otherwise his costs will not possess the value that they should have. Likewise, detailed records should be kept of repairs and renewals of all his various machines and tools.

In former days such details as these played an unimportant part in the contracting business, but to-day we find contractors purchasing and installing plant costing from a half million to a million dollars, so that the installation of plants is a very important and live topic for discussion.—The Contractor.

Use of Asphalt in Germany

United States Consul-General Robert P. Skinner, of Hamburg, gives information as to the quantity, grades, and manner of using asphalt in Germany:

Large quantities of asphalt are imported into Germany, of which a very inconsiderable proportion is received from the United States. The total importations in 1909 were 98,377 tons, and in 1908, 130,062 tons; of which Italy supplied 61,828 tons and 83,778 tons, respectively; Switzerland, 10,538 and 16,687 tons; British America, 17,315 and 18,802 tons, and the United States, 3,753 and 3,639 tons.

Asphalt is on the German free list as respects duty, when the specific gravity of the material is not less than 0.96 at a temperature of 15 degrees Centigrade, and when imported for the purpose of mixing with natural asphalt or tar for use in the manufacture of asphalt or tar board.

Soft, medium, and hard asphalts are in demand, present prices ranging from 90 to 120 marks ($21.42 to $28.56) per ton, according to grade. The largest manufacturers of paving mixtures in this city claim that prices now fluctuate between 75 and 90 marks ($17.85 and $21.42) only for the grades they require.

The total length of the paved streets in Hamburg is 443 kilometres (275 miles), of which 6 per cent. are paved with asphalt, 6 per cent. with square stone blocks on concrete foundation, 15 per cent. with square stone blocks without concrete foundation, and 0.6 per cent. with wooden blocks. In all of the classes of pavement just mentioned asphalt is used to a greater or less extent. The interstices between the large square blocks, used so extensively in the centre of the city, are filled with a mixture called Stampfasphalt, the formula for which has been prescribed by the Hamburg government. Upon many of the pavements of wooden blocks an asphalt coating is applied, producing a surface exactly like that of a solid asphalt pavement.

Modern Requirements of A Public Water Supply

The opinion of sanitary engineers, sanitarians, and in general those who are familiar with the proper development of water supply interests, has now become fairly well crystallized with respect to the requirements which a water supply should fulfill. These requirements are sanitary, æsthetic, commercial and protective in their nature. The writer has summarized them as follows:

(a) Requirement of Quality—

(1) Primarily the water supply must be free from pathogenic or disease-producing organisms. More than this, it should be free from those allied organic forms which may not as yet be recognized as accompanying disease, but which may, nevertheless, not be conducive to health. This condition of safety must prevail continuously and the supply must not be subject to what may be termed "accidental" contamination.

(2) The water must be uniformly clear and free from turbidity, both that which may be produced by suspended mineral matters, and also that which may be due to suspended organic (vegetable and animal) growths or impurities.

(3) The water must not be discolored by dissolved vegetable matters to such an extent that it may be objectionably apparent when employed for table use or in the arts.

(4) The water must at all times be free from both tastes and odors, either those produced by dissolved gases or those which may be due to the growth and decay of micro-organisms (minute plants and animals frequenting lakes, reservoirs and rivers, but usually prevailing to the least extent in the last named source.)

(5) As far as possible the water should be cool and palatable.

(b) Requirement of Quantity—

(6) The Supply must be abundant and unfailing, but for economic reasons must be conserved in such manner that all preventable waste shall be eliminated.

(c) Requirement of Physical Safety and Dependableness—

(7) The pressure under which the water shall continuously act in the distribution pipes must be ample to serve the various districts according to their specific character and needs.

(8) The system of works must be one in which design and construction may be executed in such a way that they will successfully meet conditions imposed by the natural phenomena occurring or likely to occur within the region in question.

(9) The various structures in connection with these waters should be so located, arranged, built and protected that they may not be unduly exposed to fires or other accidents befalling neighboring structures.—Charles Gillman Hyde, in the California Journal of Technography.

A paper read before a recent gathering of concrete workers contained this statement: "No greater mistake can be made by the contractor than to attempt to make money on concrete work by slighting or skimping a job." While this is not a startling statement, it is an eminently true one, and one which will bear repetition until it has been adopted as a working principle by the entire fraternity of concrete constructors. The time is soon coming when such a thing will be practically impossible. It will not be long before owners will insist on good work as a prime requisite rather than on low cost, and the very best class of work will be necessary in order to secure any business at all.

Trade News from Montreal

Plenty of Work for Contractors in the Eastern Metropolis—Supply Market Healthy — No Labor Troubles at Present

Montreal Office of the "Contract Record."
May 28th, 1910.

Montreal continues to evidence signs of a prosperous building year. The May returns, showing the extent of permits issued during the month, are not yet completed at the city building inspector's office, but these undoubtedly will show a substantial increase over the same period in 1909. That contractors generally have plenty of work on hand is a matter which architects are learning to understand more fully day by day. Calls for tenders on the part of the latter often do not interest more than 50 per cent. of those asked to submit a figure—truly an odd state of affairs.

Permits are still being issued at a good average rate from the city Building Department, and the surrounding districts are apparently enjoying a like prosperous season. Take Maisonneuve, for instance. In this busy little centre alone permits have been taken out since the first of the year aggregating approximately $300,000, and Inspector Reeves believes that building operations will be extensive during the coming summer. In Outremont and St. Lambert also, permits are being steadily issued and the present outlook is favorably regarded by those in a position to form an estimate. The fact that May has practically passed without any active disturbance from labor circles is a good sign and will undoubtedly give interested parties courage to proceed with their building plans, held in abeyance until all prospects of labor strikes should disappear from the horizon.

Supply Market

With common grades of brick contractors are experiencing no difficulties in obtaining all their requirements for immediate delivery, and plenty of this class of stock is in evidence on the local market. Pressed brick, on the other hand, are not so readily obtainable, the figures quoted being fairly stiff. No. 1 reds are worth 18.50, with buffs placed at $20 f.o.b. cars Montreal. This year the season for pressed brick was somewhat delayed owing to weather conditions, and as a result the orders have poured in with a rush to such an extent that American and Ontario markets, where our supply is chiefly drawn from, have been kept busy coping with the rush demand. Crushed stone is also actively inquired for, and while there is an abundance of this material in the surrounding neighborhood to meet all demands, the lack of cartage facilities is responsible for the present limitations to the available stock. 2-inch to 2½-inch stone is quoted at 90 cents per ton of 2,000 pounds f.o.b. quarries, with ¾-inch worth $1.25 and ½-inch, $1.50 per ton.

Cement is moving freely and there have been no alterations in prices since the quotations given at the first of the year. In painting circles an almost unparalleled season is being encountered. A buoyant and optimistic feeling permeates the whole trade, and conditions were never better. Turpentine is quoted at 84 cents in single gallon lots. Linseed oil is worth 92 cents raw, and 95 cents boiled. White lead is quoted at $5.50 to $6, according to brand, and red lead $4.75 to $5.25, both f.o.b. Montreal.

Architects' Law Amendment

The bill introduced to amend the law respecting architectural examinations and providing that only one trial be held during the year, instead of two, was defeated recently in the Quebec Legislature.

Among the recent tenders received by the Board of Control for street and sidewalk improvements were several from American firms. These were accompanied by certified checks issued upon United States banks and as this method of procedure did not conform with the practice of the city, the committee was compelled to set them aside temporarily. The tenderers threatened to take out injunctions to force the city to consider their tenders.

Montreal Harbor Plans Approved

The Ottawa authorities have finally approved of the Harbor Commissioners' plans for improvements to the Montreal harbor. This year's outlay will be approximately $2,000,000, chiefly to be spent in the elevation of tracks and embankment from Victoria pier to the sugar refinery, a distance of three miles. This work has been under way since the first of May, and already with their large staff of men considerable work has been done by the commissioners.

Extensive Dam Construction

The Ambursen Hydraulic Construction Company of Canada, Limited, 405 Dorchester street west, is erecting an extensive dam for the A. E. Reed & Company, Bishop's Falls, Newfoundland. The dam is being built for the purpose of obtaining power for the operation of the company's pulp and paper mills on the Exploit river at this point. It will have a height above the water line of 45 feet, with a total length of approximately 700 feet.

The Boston Ambursen Company has entered into a contract with the Puget Sound Bridge & Dredging Company for the erection of a dam on the Clackamus river, Oregon, for the Portland Railway, Light & Power Company. This dam will be 680 feet long. The contract also involves the construction of a large power house.

This company is also doing considerable work in the south and west for irrigation and power projects.

To Federate With Royal Architectural Institute

A special general meeting of the Province of Quebec Architects' Association is being held on Tuesday, May 31, to consider the question of the federation of the various Provincial associations of architects with the Royal Architectural Institute of Canada. In the opinion of this association a scheme for the federation of the present legally incorporated architectural associations throughout the Dominion would be of great general advantage.

Foundation Company, Limited, in Montreal

The Foundation Company, Limited, has opened an office at 76 Bank of Ottawa Building, with Mr. Alexander Allaire in charge. This company was associated with the Bishop Construction Company in the construction of the foundation for the new Canadian Pacific Railway Windsor street station. They are at present acting as engineers on the foundation work for the new addition to the General Hospital on Dorchester street east. The Foundation Company makes a specialty of pneumatic work of all kinds, heavy building foundation construction, the construction of bridge piers, mining shafts, tunnels, water power and power plant construction, sea walls, wharves, quays, dams and lighthouses.

Blumenthal Work Started

The work of tearing down the old buildings on the site of the new Blumenthal Building, corner Balmoral and St. Catherine streets, preparatory to commencing the foundation work, has been placed well under way by the contractors, Messrs. D. G. Loomis & Son. The building is to be of reinforced concrete, eight storeys in height, and will be erected according to the Kahn system, material and plans supplied by the Trussed Concrete Steel Company of Canada, Limited. Mr. G. B. Reynolds, sales agent and engineer.

New Coal Storage and Distribution Plant

The Montreal Light, Heat & Power Company have awarded the contract to Messrs. D. G. Loomis & Son for the erection of a new coal storage and distribution plant which will be approximately 185 feet by 190 feet, and 45 feet high. The structure, which is to be built in the east end of the city close to the company's gas plant, will be of reinforced concrete and of a special design supplied by Mr. G. B. Reynolds, engineer for the Trussed Concrete Steel Company of Canada, Limited. Kahn bars and rib-metal are specified and the construction will include columns 40 feet in height. The roof beams are designed to carry an electric traveller of 12 tons which will be suspended from tracks attached to roof beams.

Builders' Exchange Luncheon

The officers of the Montreal Builders' Exchange are planning an informal luncheon for the members of the association, to be held at an early date. Mr. Wm. H. Sayward, of Boston, Mass., a well known figure in American building circles, is expected to be present and to deliver an interesting address.

St. Timothee Construction Work

The Canadian Light & Power Company have awarded the contract for the reinforcing of sidings, partitions and roof of the new power house in course of erection at St. Timothee to the Trussed Concrete Steel Company of Canada, Limited. Mr. G. B. Reynolds, engineer and salesman. Kahn Hy-rib metal will be used for the walls, sidings and partitions, and rib-metal for the roof. Messrs. J. G. White & Company, New York, are the supervising and consulting engineers.

Mr. P. C. McGovern, general contractor on the construction of the Montreal Lateral Conduit, has sent the Board of Control a bill for $15,000, extras supplied on this job.

Mr. Sidney P. Howard, for a number of years general freight agent Eastern Division, Canadian Pacific Railway Company, has resigned, to engage in a real estate business with Mr. John Findlay, of Montreal. The new firm will be known as Messrs. Findlay & Howard.

The Ambursen Hydraulic Construction Company of Canada, Limited, are prepared to furnish insurance of the highest responsibility on the Ambursen dam. This may be secured for the construction period only, or as a permanent insurance to be renewed from year to year. It is effected at a reasonable premium rate and also carries with it in each case the inspection and approval of the consulting engineers of the insuring company, both as regards sufficiency of plans and excellence of subsequent construction. This entirely new departure in hydro-electric developments serves to emphasize the character of the work which this company designs and constructs.

The work of constructing the viaduct at Outlook, Alta., for the Canadian Pacific Railway Company has just been commenced, and the Raymond Concrete Pile Company will shortly have a plant in operation on the premises to carry out this work.

The assignment of Mr. Thos. Wand is recorded. In order to facilitate the winding up of the estate this move was considered advisable by a number of the creditors. If, however, the estate produces 30 cents on the dollar, Mr. Wand will be given a release in full.

From the Federal Capital

Ottawa city has more paving contracts on hand than it seems possible to accomplish this season. The longest are mile stretches on St. Patrick street and Bank street. City Engineer Ker is endeavoring to have the latter done without fail by September, as it is on the route to the Central Canada Fair Grounds.

The corporation's notice to persons served by a new sanitary sewer in the western portion of the city, costing altogether $52,532, shows that the cost per lineal foot was $4.73. The work was chiefly through rock.

City Engineer Ker has ascertained that the consumption of water in Ottawa is 16,000,000 gallons a day, or 198 gallons per head of population. The greatest consumption in any other city is found to be 120 gallons per capita and in Toronto only 80 gallons. The enormous use of water in the capital is partly attributable to building operations, but the people must be wasting or the consumption would not reach so remarkable a figure. Letting taps run continually in houses and wasting water on lawns, are important sources of loss, according to the engineer. Despite the loss, the city engineer says it would not pay to install meters in all the houses to control the consumption.

John O'Leary, one of the best known municipal and government contractors of Ottawa, died from a stroke of paralysis on May 20. Many of the city's pavements were laid by him. He was 69 years of age, and came to Ottawa from his birthplace in Wexford, Ireland, when 22 years of age. For many years he was alderman for St. George ward.

Mayor Hopewell, of Ottawa, and President Peter Whelen, of the Ottawa Board of Trade, and the Mayor of Smith's Falls, have all taken a strong stand against allowing the C.P.R. to use the present bed of the Rideau canal for an entrance to the city, as proposed in their new project to run a tunnel from the Central to the Union depot.

Ottawa architects are divided as to the wisdom of the proposed building by-law to limit structures to eight storeys. This and other features of the measure are so contentious that it will be some time before it is disposed of. A by-law governing the inspection of electrical wiring has also been laid aside temporarily.

Permission has been granted the Canadian Pacific Railway to appeal to the Supreme Court against the decision of the Railway Commission ordering them to run their Pontiac and Gatineau trains to the Central station. The applicants for the service of the Central contended that it was a hardship to compel the public to go from the centre of the city to the Union depot to take a train for the Gatineau summer resorts. The railway company claims that it would be impracticable to make the change, as it means backing trains over the new interprovincial bridge spanning the Ottawa river.

Personal News and Notes

Building permits issued to date at Winnipeg, Man., total over $7,000,000, an advance of $2,000,000 over the same period of last year.

At the recent convocation at Queen's University, the degree of Doctor of Science was conferred upon Professor Herdt, of Montreal, Que.

Mr. J. Howard Bridge, the English sanitary expert and inventor of the Bridge system of water purification by the ozone process, left Montreal last week for Ogdensburg, N.Y.

Mr. W. B. Boyd, chief engineer of the Toronto Power Company, has gone to Winnipeg to consult with Dr. Herdt, Montreal, as to the best remedy for the electrolysis troubles experienced in that city.

Mr. R. E. W. Hagarty, secretary of the Canadian Cement and Concrete Association, who has been abroad for the past month or so studying European methods of engineering organization, left Liverpool for Toronto on the 21st ult.

Mr. D. P. Roberts, electrical engineer, of London, Ont., has resigned. He is stated to have received a tempting offer from a large manufacturing concern about to locate in Can-

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50	Private Residences	1,023,050	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables,	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and Fire Houses	208,664	28,837
656	Total 1st	12 800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
717		17,562,741	

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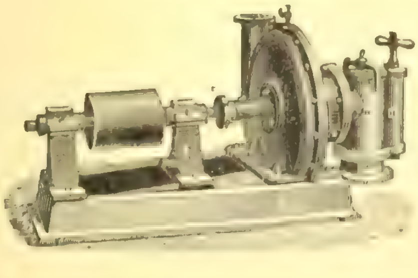

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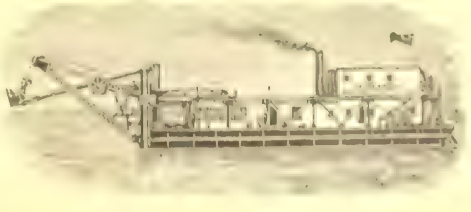

[illegible] Mr. Roberts was appointed assistant electrical engineer at London about a year ago, and only succeeded to the higher position a couple of months since.

Mr. A. P. Forde has been appointed superintendent of construction in British Columbia for the C.N.R. For many years Mr. Forde was resident engineer for the C.P.R. at Revelstoke, B.C.

Mr. J. C. A. Heriot, of the firm of Messrs. MacVicar & Heriot, architects, Montreal, was unfortunate enough to be thrown from his carriage recently, thereby sustaining a broken shoulder bone.

At a meeting of the Manitoba Good Roads' Association, held last week at Winnipeg, it was decided to ask the Provincial Government to assist in the holding of a Good Roads' convention at Winnipeg during the Exhibition. A committee was appointed to interview the Premier.

The Phoenix Bridge Company have entered upon the removal of the Quebec bridge and its approaches, in order to make way for the new structure. The work is in charge of Mr. Milliken, chief of construction for the company. The greatest care will be exercised in this work, with a view to utilizing the material on government railroad construction.

Mr. R. A. Thompson, city engineer of Seattle, Wash., and City Engineers Clement, of Vancouver, B.C., and Hanes, of North Vancouver, have been appointed a commission to bring in recommendations for the establishment of permanent grades in the last named city. A unique feature of the situation is that Mr. Thompson's services are gratis—with the compliments of the city of Seattle.

Warehouse of Mussens, Limited, Montreal

A recent arrival at Montreal was Mr. A. K. Robertson, C.E., a member of an English railroad contracting firm, the McAlpine-Robertson Construction Company, of London and Glasgow. Mr. Robertson will remain in Canada for two or three months, making observations with a view to locating a Canadian branch for his firm. The McAlpine-Robertson Company are reinforced concrete specialists and employ on an average about 6,000 men in the old country.

The death occurred at Ottawa last week of Mr. James Bruce Spence, chief draughtsman of the Department of Railways and Canals. The late Mr. Spence was born at Balmande, Scotland, in 1832 and came to Canada at 25 years of age. He was associated with the Department of Railways and Canals for 34 years. One of his most notable works was the designing of the "Soo" canal. Deceased left three sons, of whom Mr. A. W. Spence, engineer-in-charge on the Trent canal, will be known to many of our readers.

New Head Offices of Mussens, Limited

Mussens, Limited, Montreal, dealers in railway and contractors' supplies, have removed from their old offices on the corner of Victoria Square to a large five storey building on the opposite side of St. James street.

Increases to the staff, caused by the expansion of business, had rendered the old offices too congested, and the show space for machinery and supplies was entirely inadequate. By the new move they have been enabled not only to lay out more commodious offices but also to reserve two floors for exhibition purposes. We illustrate the new offices and showrooms and also the warehouses, which are excellently equipped for handling heavy machinery. The warehouses have a capacity of about 100 carloads of stock, and have a wide driveway running clear through the building from end to end, opening on two streets. They are excellently located near the railroads and navigation companies.

The new Headquarters of
Mussens, Limited, Montreal

Mussens, Limited, now have branch offices and warehouses in Cobalt, Winnipeg and Vancouver. They also have offices in Toronto and Calgary. From a small beginning this firm has become the largest of its kind in the Dominion of Canada. Their principal lines are machinery and supplies for railways, mines, contractors, municipalities and machine shops. They have a well equipped engineering department which looks after the designing, supplying and erecting of complete plants for various purposes, such as quarrying, mining, and so on.

Their latest move is another indication of the rapid and steady growth of this firm, which, since its inception, has attained a reputation for reliable and efficient business methods.

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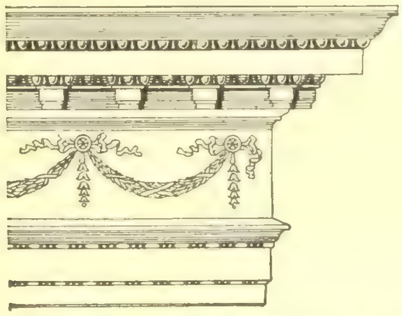

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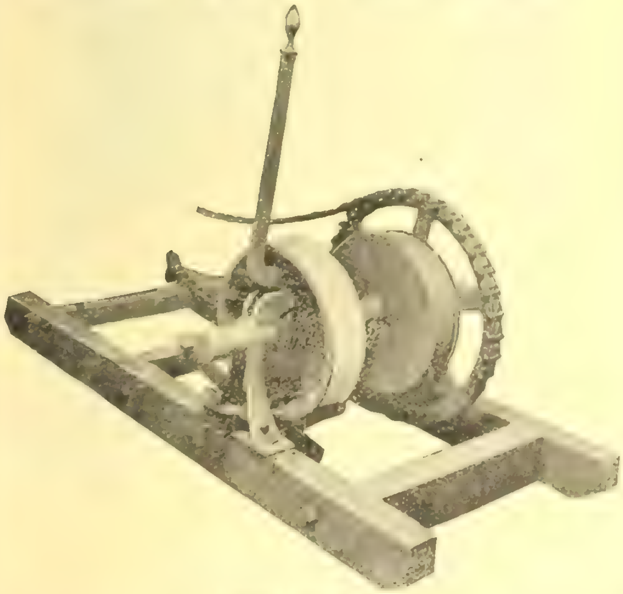

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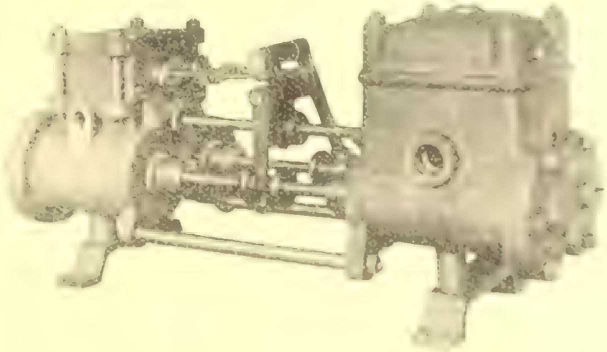

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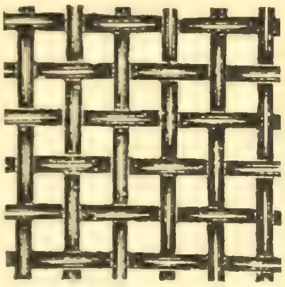

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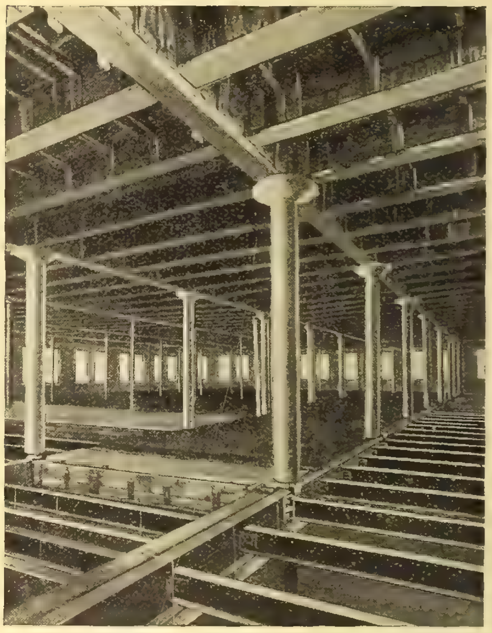

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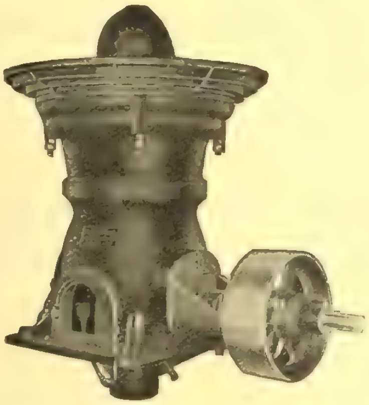

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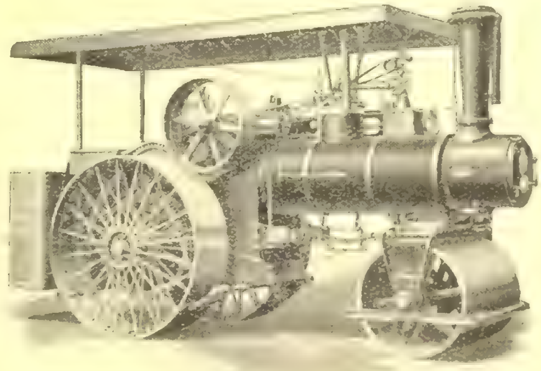

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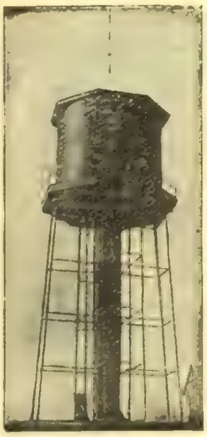

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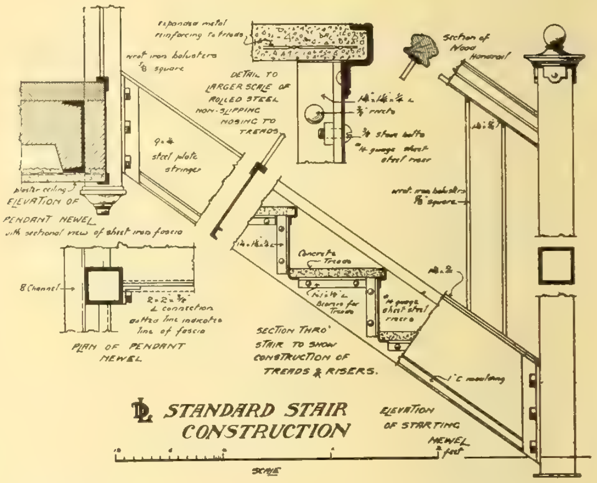
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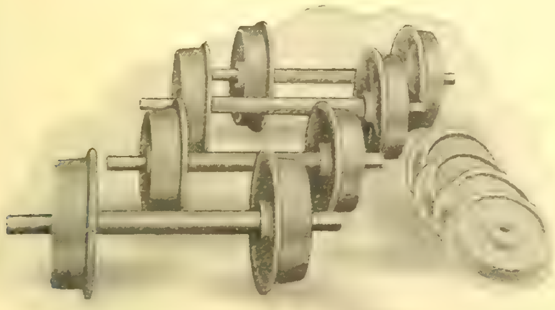

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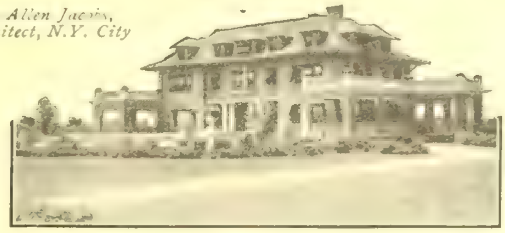

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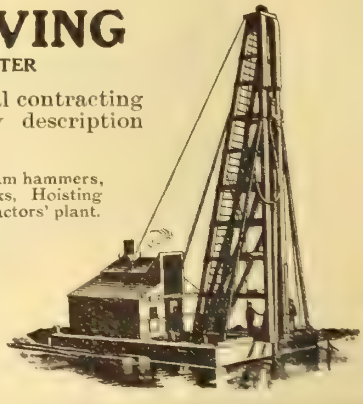

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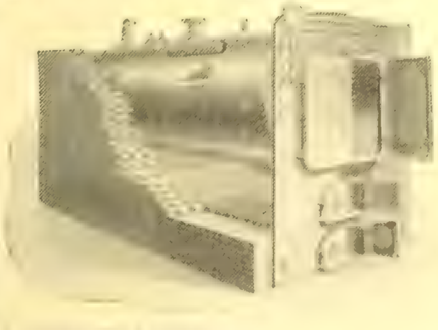

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Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work	$10.00 to 11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D,D.
10 to 25 united inches	$4.25	$ 6,25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i,	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	.,..	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex, and 3-16 inch round, 58 cents per square foot up.

Floor Tile—½-inch square 65 cents.

Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, firsts 70 cents.

Capping Coves and corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.

High grade compression work, 60 per cent.

Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.

Boilers—Galvanized Iron Range,

30-gallon, standard, $4,50; extra heavy, $7.00.

CastIron Sinks.

16 x 24, $1.00; 18 x 30 $1.15; 18 x 36, $1.95

Lead Pipe.

Lead pipe, 80 per cent. off; lead waste, 80 per cent. off; caulking lead, 4¾ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

7 and 8-inch pipe, 40 per cent.

Light pipe 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL. Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.

Cement, car lots, f.o.b, Toronto, bags extra, $1.75.

Crushed stone, $1.25 per ton, f.o.b. Toronto,

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $14 to $15 per toise.

Free stone delivered, $14 to $15 per toise.

Brown coursing stone, delivered, $3.25 to $3,50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.25 to $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per thousand.

Steel channels and beams, $2.75 per 100 pounds, delivered, f.o.b. Toronto.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

Lime, per cwt., delivered, 38 cents,

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plaster, unsanded, $10.50; sanded $5.50;; universal finish, $15.50.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $7.50 to $8.00 to $9.00 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs,

Boiled Linseed Oil, in barrels, $1.00 per gallon of 9 lbs.

Raw Linseed Oil, in barrels, 97 cents per gallon of 9 lbs.

Turpentine, in barrels, 81 cents per gallon.

Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Probably the first contract to be let for the Hudson Bay Railroad will be for the construction of the bridge across the Saskatchewan at The Pas and this will cost about $250,000. About $350,000 will also be available for grading. As the country north of The Pas is especially favorable for railway construction, this sum should be sufficient to carry on the work for a considerable distance out and contracts will probably be let for the first 40 miles, all of which has now been located. At the present time there is available the sum of $680,000 for engineering and construction if the $500,000 included in the government supplementary estimates is passed. Of the total sums available it will need approximately $80,000 for the pressing forward of the engineering and location work, which is now being carried on. Three parties are now in the field. Still other parties will be put out as soon as navigation opens to the upper end of Lake Manitoba.

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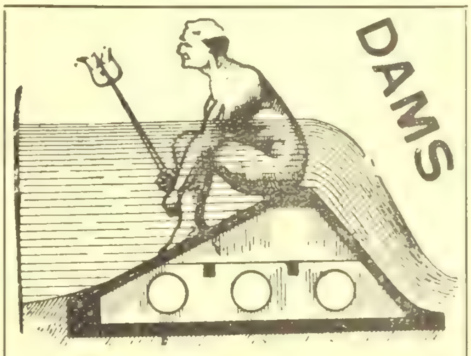

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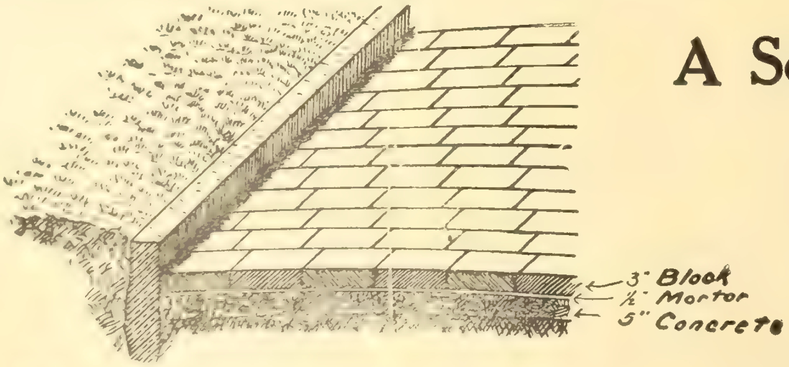

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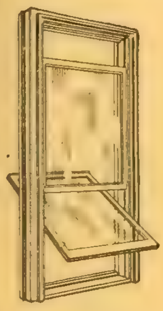

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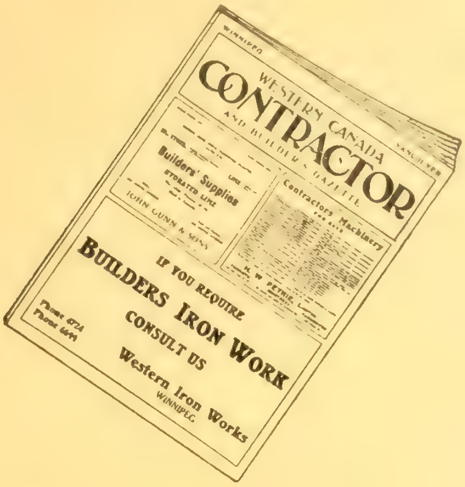

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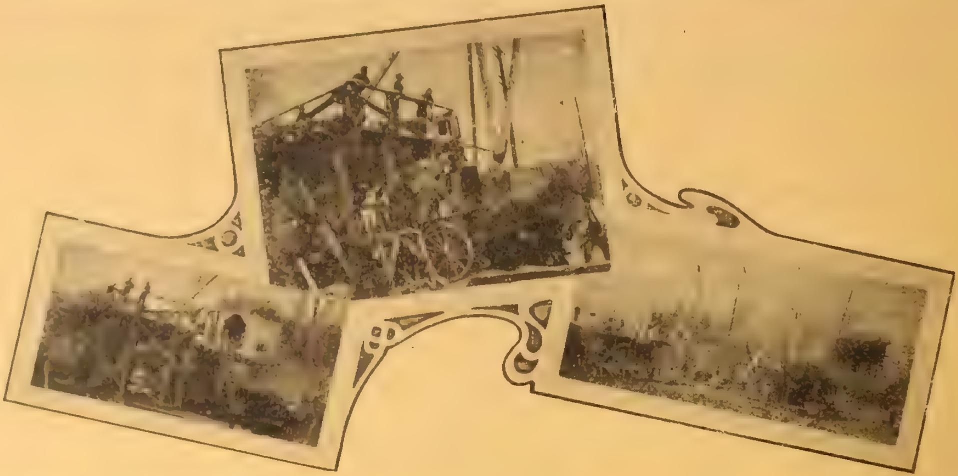

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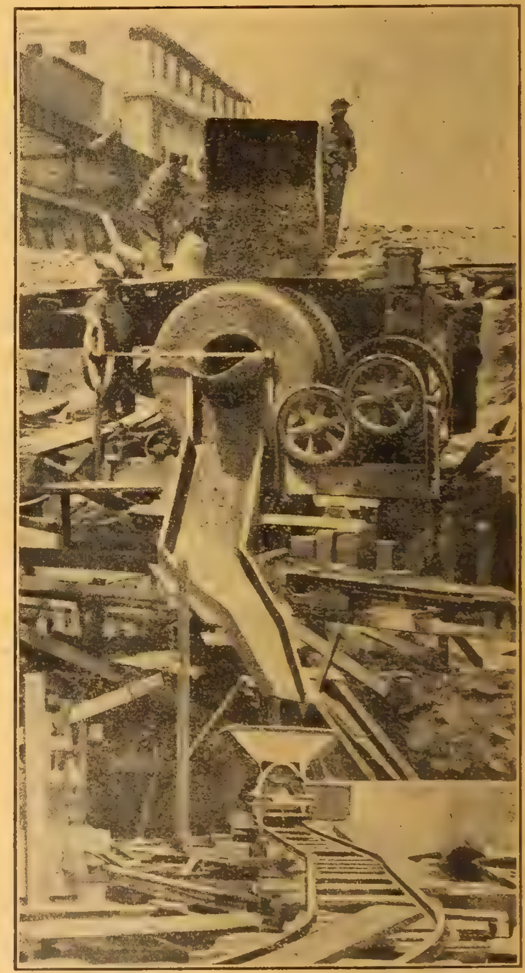

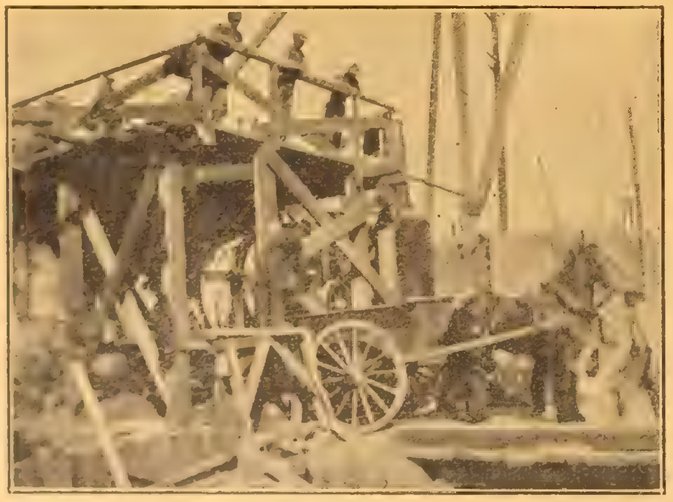

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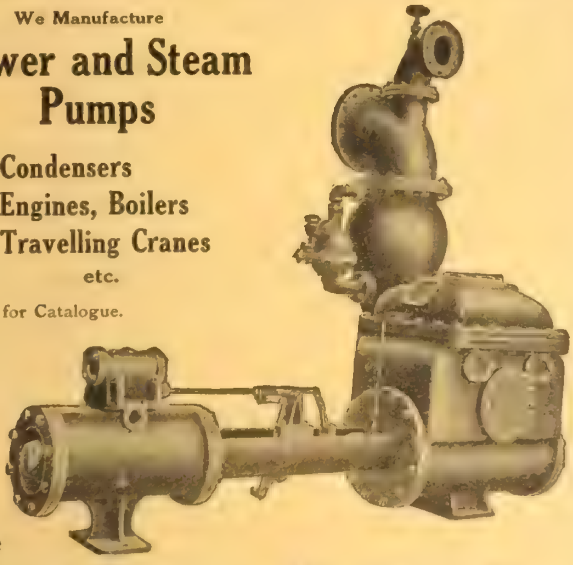

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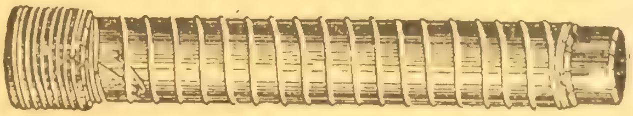

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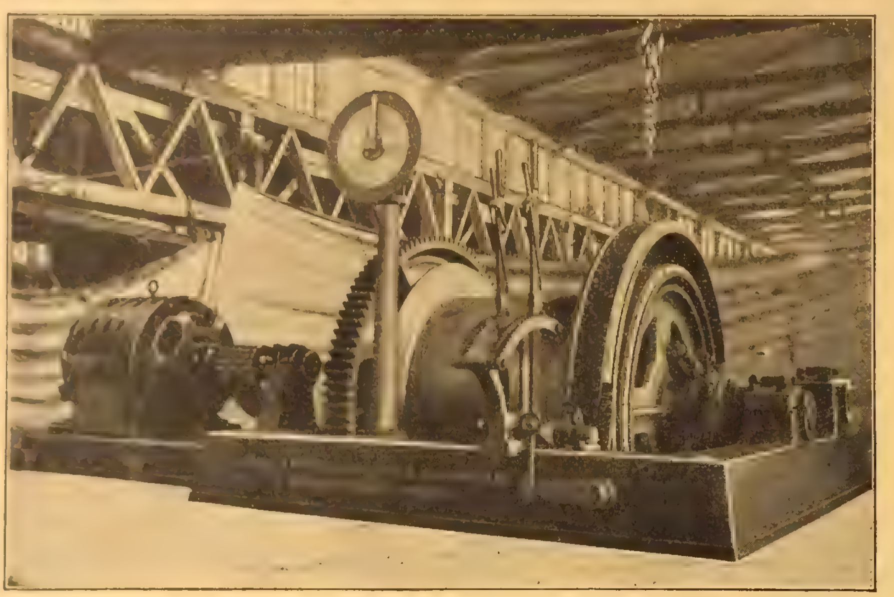

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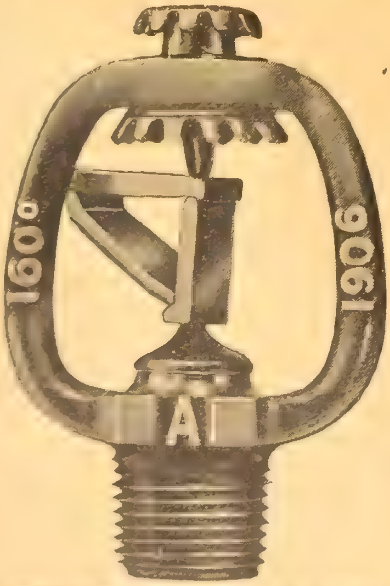

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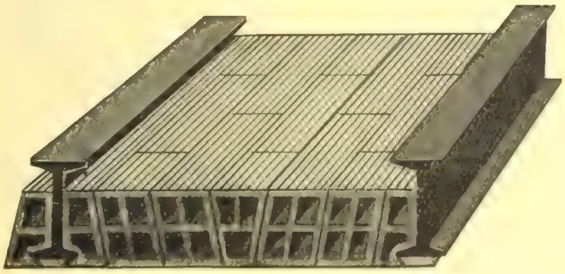

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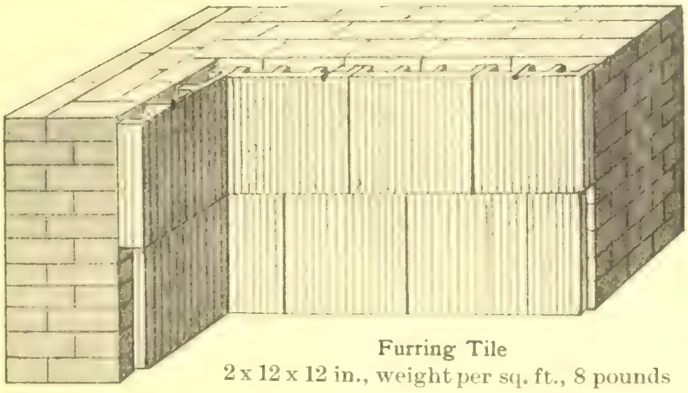

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With them **A FIREPROOF DOOR** can be adjusted any way, in or out, up or down, **by simply turning a screw.** If a door sags, it is raised, if up too high, it is lowered, if chafing against the brick wall, it is brought out, if out too far, it is placed in, **the work of but a minute.** Think how much time this saves in hanging a door, and what a satisfaction it is to a client after the doors are installed.

Specify the Ormsby "Underwriters" Fireproof Doors, fitted with **Adjustable Hangers.**

Manufactured by

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TORONTO and WINNIPEG

Experts in Fireproof Windows and Doors

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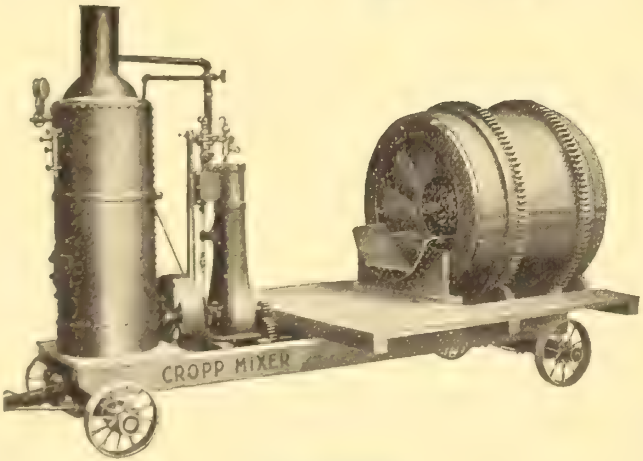
Cropp Mixer



Low Charging
Covered by U.S. Patent No. 947,196.

We are bringing out a small Mixer number "O" which holds a One, Two and Four mix. This Mixer is very light and portable—just the thing for small Contractors.

Our Prices Will Interest You

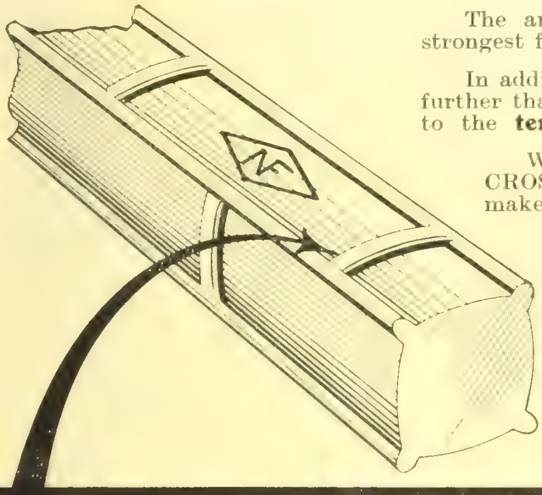
The only Mixer that will not spill when overcharged

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

It Adds to Strength and Lessens Strain

Here is a cut of a section of the

"NF" Reinforcing Bar for Concrete



The arrow points out the **longitudinal rib** which is one of its very strongest features.

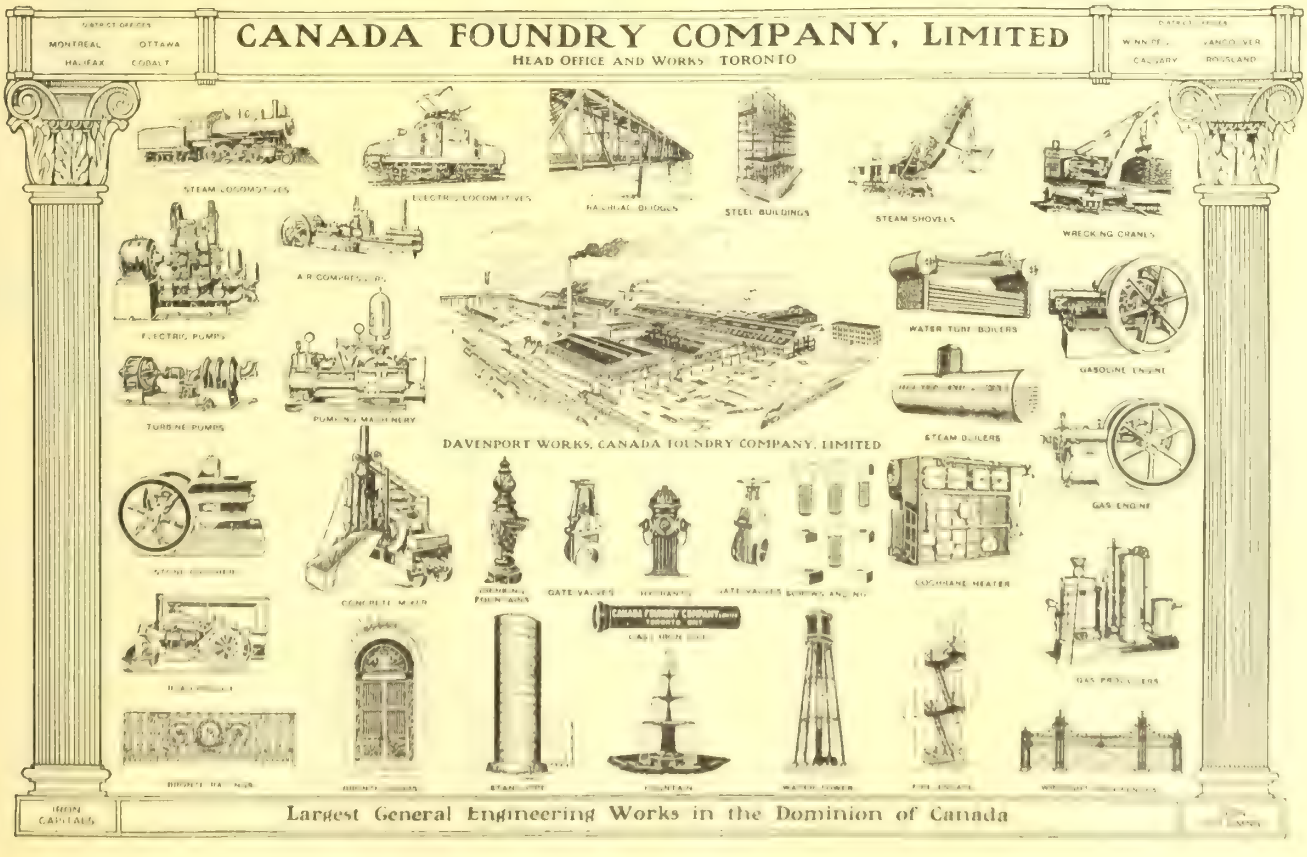
In addition to the usual advantages claimed for deformed bars, we claim further that the **longitudinal ribs** on the four corners of the (NF) Bar add to the **tensile strength** and prevent **torsional strains** in the concrete.

We have proven this to be an established FACT. In addition the CROSS RIBS form a mechanical bond, so that less metal is required to make a PROVEN BOND under OURS than under any other system.

Does this mean anything else than a SAVING in COST, not only in the **first instance** but so long as the **building will stand?** Is it possible to figure the case out in any other way?

We should like to send you some literature on this point, may we?

ONTARIO IRON & STEEL CO LIMITED TORONTO CAN.



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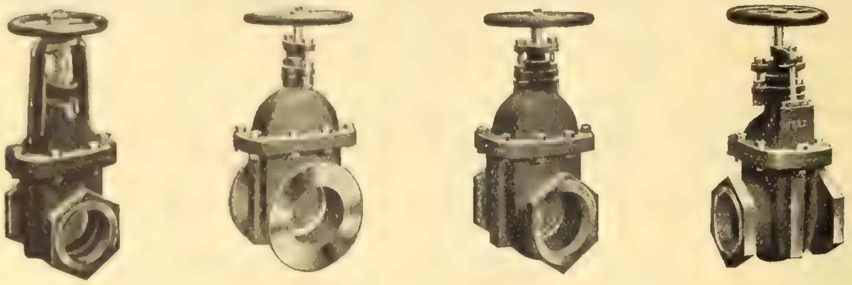
Largest General Engineering Works in the Dominion of Canada

IRON BODY GATE VALVES



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Gate Hydrant, "Ludlow" Type.

We make valves of all sizes, suited for any purpose or pressure.

Our hydrants and waterworks supplies have been in use for many years, subjected to the severest tests and have been found reliable under all conditions. Excavating for repairs is a big item to every municipality, it will pay to install our goods and do away with repairing.

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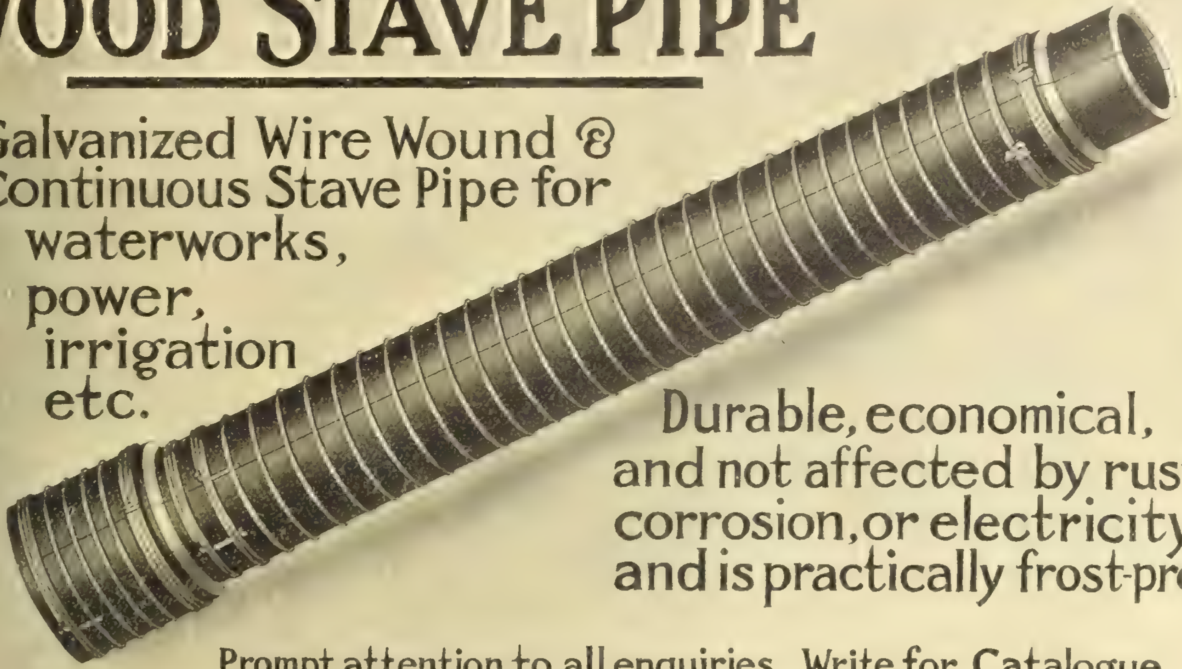
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

Indicator Post for Fire Protection Valve

WOOD STAVE PIPE



Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
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etc.

Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

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Brantford "Automatic" Batch Concrete Mixer

Two Sizes

The most up-to-date Mixer built

We also manufacture

Hoists, Gas and Gasoline Engines, Towers, Tanks and Windmills

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MIMICO, ONTARIO

"MIMICO" Pipe Makes the Sewer Sure

Toronto Officials Recognize the Fire-Resistant Qualities of

Brantford Roofing

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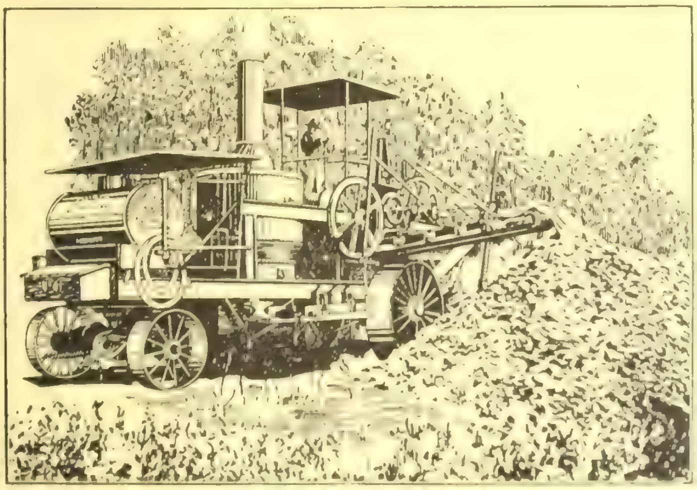
Send for interesting Roofing Book and samples.

Brantford Roofing Company, Limited

Brantford, Canada

Time Consumed in Selecting a Trench Excavating Machine is not Time Lost



Trench Excavation is about the most severe and exacting work to which a Machine Excavator can be put.

The up-to-date Contractor wants to select a Machine which will possess qualities on which he can absolutely rely when figuring on a contract.

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Our Trench Excavator will dig a trench 27 in. to 60 in. wide, and any depth down to 20 ft.

Mr. Contractor, if this is the Machine you want for your work, we are at your command.

J. W. Harris Mfg. Company, Ltd.

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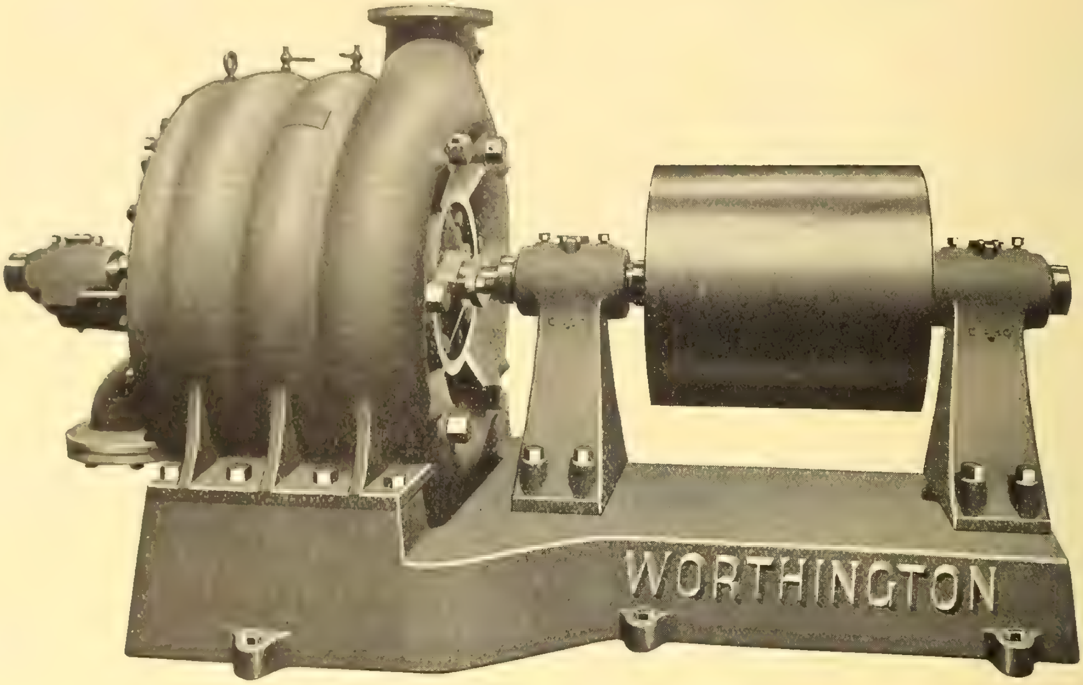

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Missisquoi Marble

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It's the make that lasts the longest, looks the best

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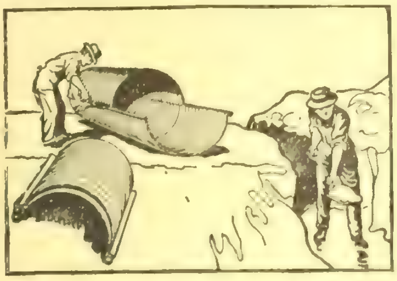

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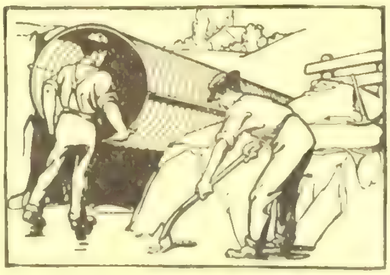
NESTABLE GALVANIZED

CULVERT

Skilled Labor Needless
Simple and Easy to Lay
Easiest Transported
Most Durable
Endorsed by Railways and Road Officers



The pictures here suggest how easily Pedlar Culvert can be laid. Shipped in nested half-sections, saving freight and cartage. **Only Culvert that you can break joints on.** Triple-thick, flat flange lock-rib adds vastly to its strength. Heavy-gauge Billet Iron, best quality, curved cold and then corrugated. Thick galvanizing makes whole surface absolutely corrosion-proof. Absolutely unrivelled for **every** culvert purpose.

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All Sizes
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¶ For Roadways and Sidewalks also specially adapted for

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is made quite differently to any other stone. Don't be deceived by the old just-as-good story. :: ::

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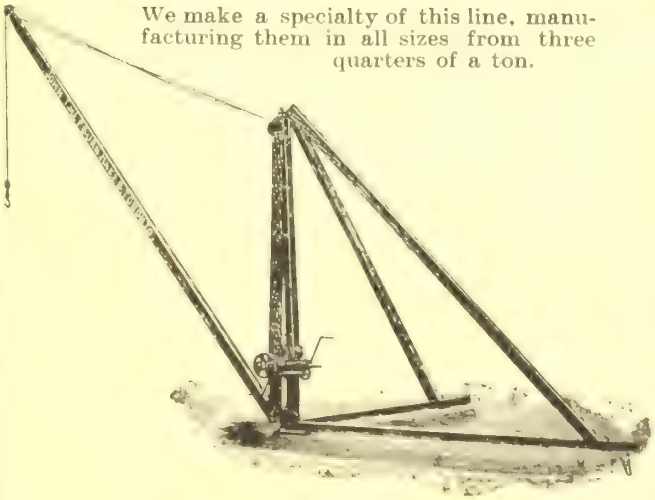
Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine and the "New State" Concrete Mixer.

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Prices on application

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High
Grade
Fire
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For
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Blast Furnaces
Boiler Settings,
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Cupola Block
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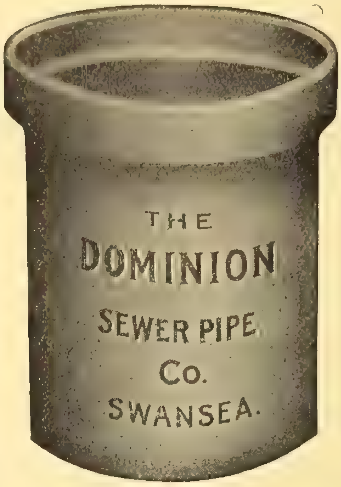

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Factories:
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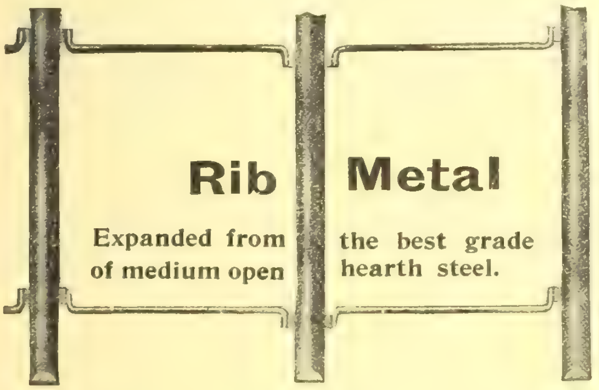
Products include:—Kahn Truss Bars, Cup Bars, Rib-Metal, Hy-Rib, Metal Lath, Column Hooping, Trussed Concrete Chemical Products.



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Large Flanges

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THAT CAN BE PRODUCED ANYWHERE

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HARDWOOD FLOORING

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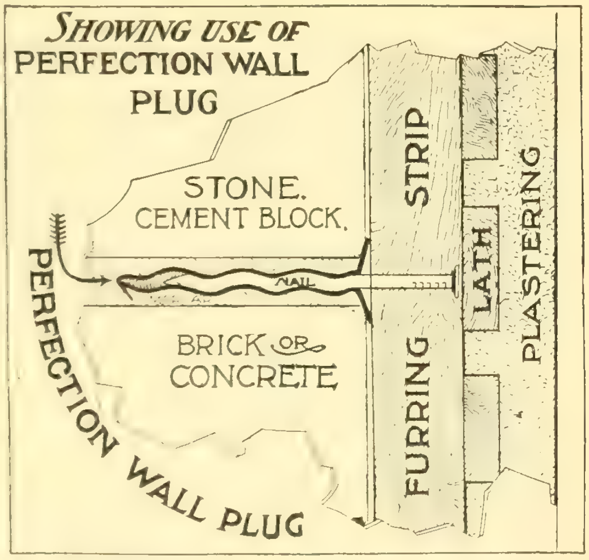

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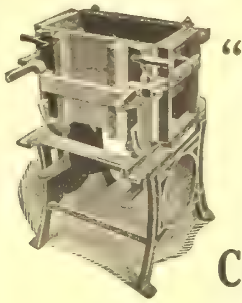
Contract Record

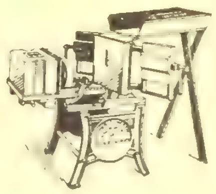
Toronto - Canada



"London"

Face-down

Adjustable



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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Burlington, Ont.

Tenders are required for building cement walks until June 15th. O. T. Springer, clerk.

Brampton, Ont.

Tenders addressed to T. J. Blain, town clerk, will be received until June 13th for grading about 7,200 square yards of roadway; 5,000 feet concrete curb and gutter combined; 2,500 feet of macadam road 26 feet wide. Plans, etc., at office of town engineer. T. Thauburn, mayor.

Cobourg, Ont.

The town of Cobourg will receive tenders until June 13th for the construction of $2,500 worth of concrete walks. For further particulars see "Tenders and For Sale Department" of this issue.

Chilliwack, B.C.

A by-law to authorize the expenditure of $70,000 for drainage system will be submitted to the ratepayers shortly.

Coldwater, Ont.

Tenders addressed to J. R. Russell, clerk, will be received until June 18th for the following: A, cast iron supply main and distributing system; B, ground reservoir, collecting pipes and drains. Plans, etc., at office of the consulting engineers, the John Galt Engineering Company, Toronto, and at the office of the Canadian Engineer, Board of Trade Building, Montreal.

Dauphin, Man.

Tenders will be received until June 15th for the purchase of $75,000 5 per cent. 20-year waterworks and sewerage debentures. J. W. Johnston, secretary-treasurer.

Fairville, N.B.

Ratepayers of Fairville will vote on a sewerage system.

Leamington, Ont.

Tenders addressed to A. Baird, C. E., will be received until June 20th for dredging work, supplying and placing in new pumps, etc., new steam boiler, new engine, etc. Plans, etc., at office of above.

Lachine, Que.

The ratepayers authorized the council to negotiate a loan of $125,000 by the issue of debentures for the purpose of laying pavements and roadways within the city limits. A total of $128,000 will now be raised for this purpose.

Lethbridge, Alta.

Tenders are being received until June 10th for grading, etc., amounting to about 130,000 cubic yards. C. M. Arnold city engineer.

Montreal, Que.

The City Surveyor contemplates an extension of the waterworks system on Queslin street from Dominion to Fulford street.

New Westminster, B.C.

Tenders are required for the laying and jointing of about 14 miles of 25 inch riveted steel watermain and about 7,780 feet of 12 inch and 7,500 feet of 13 inch lap-welded pipe. Plans, etc., with City Engineer. W. A. Duncan, City Clerk.

North Toronto, Ont.

The by-law to expend $25,000 for enlarging the town's water supply was defeated.

Nanaimo, B.C.

Lowest tender received for construction of concrete walks; W. H. Worswick, Victoria, B.C. Retaining walls, per yard cub., $4.50; filling, per yard, cub., 45 cents; cement concrete sidewalks, 1 in. crete sidewalks, 3-4 in. finish, per yard super., $1.24; ordinary excavation, per yard cub., 20 cents; rock excavation, per yard cub., $1.50; laying and jointing 4 in. vitrified pipes, per foot lin., 30 cents (up to 4 feet in depth, but not in rock); laying 4 in. tile drains, per foot lin., 10 cents.

Ottawa, Ont.

Plans are being prepared at the Department of Public Works for the new plaza between the Dufferin and Sappers' bridges and tenders are to be called for this summer. The designs now being prepared provide for work of a most ornate appearance.

N. H. H. Lett, secretary, writes that the Board of Control has awarded contracts for paving Bank and St. Patrick streets to the Barber Asphalt Paving Company, for $37,565 and $45,750 respectively, subject to council's approval. List of tenders received:—Bank street—The Barber Asphalt Paving Company, $37,565; Ottawa construction Company, $37,989; Union Construction Company, $41,764.55; City Engineer, $47,673. St. Patrick street—The Barber Asphalt Paving Company, $45,750; Ottawa Construction Company, $49,495; Union Construction Company, $50,750; City Engineer, $59,522.70.

Point Grey, B.C.

The council is calling for tenders until June 15th for grading Chaldcott road to the North Arm of the Fraser river. Specifications on application. H. Floyd, C. M. C., Municipal Hall, Kerrisdale.

Red Deer, Alta.

On June 20th, the ratepayers will vote on the following by-laws: $4,000, new pump; $500, fire hose; $2,500, concrete sidewalks.

St. John, N.B.

The Board of Works decided to instruct the engineer to call for tenders immediately for the laying of an asphalt pavement in Germain street, between Princess and Queen streets.

Saskatoon, Sask.

A by-law will be voted on to issue $62,000 4½ per cent. 30-years sewer and waterworks construction, and $15,000 [illegible] per cent. 10-years concrete sidewalks debentures. J. H. Trusdale, returning officer.

Toronto, Ont.

The Waterworks Department requires meters estimated to cost [illegible].

Tenders will be received until June 11th for construction of asphalt, bitulithic, treated wooden block, and brick pavements, concrete curbs and walks; and sewers. G. R. Geary, chairman, Board of Control.

The city will extend the water mains and provide additional hydrants for improving the fire protection in the vicinity of the Parliament Buildings. The cost, $7,000, will be paid by the province.

Uxbridge, Ont.

M. H. Crosby, town clerk, will receive tenders up to June 15th for the laying of 25,000 feet of cement sidewalk. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

Victoria, B.C.

It was decided to call for tenders for the execution of the work of laying cement sidewalks on five streets at a cost of $40,000. A. Smith, city engineer.

The following tenders for paving have been submitted: The Warswick Company, Cook street, $30,850.07; St. Charles, $12,904.50; Southgate, $5,681.20; Linden avenue, $42,566.72. Albert Pike tendered on but one street, St. Charles, at $20,558.60. The Pacific Paving Company did not submit a tender in bulk sum, but worked out the specifications in quantities. The city engineer's tenders were as follows: Cook, $34,312; St. Charles, $16,997.50; Southgate, $7,330.60; Linden, $45,475.

Walkerville, Ont.

Tenders will be received by the town clerk, C. H. Robinson, until June 14th for the construction of about 2,000 square yards of sidewalk. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

AWARDED.

Beith, Que.

The contract for 8 miles of macadam roads has been awarded to O'Connor Bros., of Huntingdon, Que., for $23,800.

Montreal, Que.

The Board of Control have awarded contracts as follows for general supplies: Tile and sewer pipes, W. McNally & Company; lumber requirements, J. T. Marchand & Company; bricks, J. Bourdin.

The Board of Control have awarded contracts for a 4,000 ton supply of cast iron pipe, lowest tender being accepted in each case: Mr. Beverley Robinson, representing Stanton Iron Works Company, Limited, Nottingham, England, 4 inch pipe $29.50, 12 inch pipe $27.50; Robert McLaren & Company, Glasgow, represented by L. H. Gaudry & Company, Quebec and Montreal, 6 inch pipe $29, 8 inch pipe $27.90, 10 inch pipe [illegible], 16 inch pipe [illegible], 20 inch pipe $27; Canada Iron Corporation Company, Three Rivers, Que., 24 inch pipe $27, 30 inch pipe $27.50.

North Vancouver, B.C.

J. O'Connor was awarded the contract for laying water mains throughout D. L. 553 for the sum of $705.

Outremont, Que.

Mr. [illegible] has been awarded the construction of sewer from Van Horne street to Dansher street, to Pacific avenue, at $20,663. Messrs. R. T. Smith & Company were awarded contract for the construction of 2 feet x 3 inch brick sewer on Maplewood avenue at $4,829, and also the sewer on De L'Epee avenue at $8,041.

Ottawa, Ont.

The contract for supplying ten joints for water pipes has been awarded to Gordon Law, whose price of $1,650 was the lowest. The highest tender, that of the Canada Foundry Company, $3,300.

Prince Albert, Sask.

C. O. Davidson, city clerk, writes that the contract for construction of extensions to the water and sewerage systems, etc., has been awarded to John Craig at $18,960. Only one tender was received.

Richmond, B.C.

Tenders for the wood pipes, steel pipes, valves and special castings for the new waterworks were awarded as follows: The Pacific Coast Pipe Company, $69,931.86 for wood pipe; Evans, Coleman & Evans, $16,490.12 for steel pipes; Forsyth & Company, a sum of $480 for cast iron pipes; Forsyth & Company, $765 for valves; Terminal City Iron Works, $760 for special castings.

Regina, Sask.

Following are particulars of recent tenders and awards for city paving and sidewalk construction: For pavement complete—National Paving & Construction Company, sheet asphalt, $3.00 per square yard; total $106,140. Bitulithic & Construction Company, bitulithic pavement, $3.05 per sq. yd., total $109,385; Creosote block pavement, 3-inch 16-lb., $3.45 per sq. yd., total $122,225; R. Blome & Company, granitoid, $2.99 per sq. yd., total $107,459; R. Banghom, 3-inch asphalt block, $3.72 per sq. yd., total $130,074; R. Banghom, 2½-inch asphalt block, $3.39 per sq. yd., total $119,481; Kettle River Quarries Company, creosote block, 3-inch, 16-lbs., $3.60 per sq. yd., total $127,860; Forest Sity Paving Company, creosote block, mortar cushion, 3-in. 16 lbs., $3.32 per sq. yd., total $117,234; mortar cushion, 3-inch, 16 lbs., $3.24 per sq. yd., total $114,666; City Engineer, creosote block, sand cushion, 3-in. 16 lbs. $3.20, total $115,020. The council decided to accept the tenders of R. Blome & Company for granotoid pavement, 27,40 sq. yds., and of the National Paving & Construction Company for sheet asphalt pavement, 4,700 square yards. Forest City Paving Company, for sidewalk, 17 1-3 cents per foot; excavation in excess of 8 inches, 70 cents per cubic yard; total $8,972.60. Western Pavers, Limited, sidewalk, 18 cents per foot; excavation in excess of 8 inches, 70 cents per cubic yard; total $9,000.00. City Engineer, sidewalk, 20 cents per foot; excavation in excess of 8 inches, 45 cents per cubic yard; total $10,197.00. The council decided to accept the tenders of the Western Pavers, Limited. The total quantity of sidewalk is 50,000 square feet. The total approximate quantity of excavation is 438 cubic yards.

St. John, N.B.

The contract for cast iron pipes have been awarded as follows: Watson Jack & Company, Montreal, $28.20 per ton; other tenders, Stavely Coal & Iron Company, $29.15 per ton; W. Beverly Robinson, $29.80; D. Y. Stewart & Company, $30.30 per ton; H. A. Drury Company, Limited, $31.55 per ton. Tenders for terra cotta sewerage pipes were received from C. H. Peters Sons, Limited, J. Willard Smith and Jas. Robinson Company, Limited. The contract was awarded to Messrs. Peters, whose tender was the lowest, as follows: 300 feet 15 inch, 52 cents per foot; 1,200 feet 12 inch, 33 cents per foot; 800 feet 9 inch, 22 cents per foot; 22 feet 6 inch, 13 cents per foot; 30 feet 12 x 6 junctions, $1.40 each; 30 feet 9 x 6 junctions, $1 each; 30 feet 6 x 6 junctions, 75 cents each.

The following tenders for permanent paving were received: Smythe street, B. Mooney & Sons, $15,040.40; McDonald & McLeod, $18,075.50; Hassam Paving Company, $14,752.50. Nelson street, E. R. Reid, $13,758.50; McDonald & McLeod, $12,833.50; B. Mooney & Sons, $10,440.42; Hassam Paving Company, $10,266.90. Main street, McDonald & McLeod, $31,182.35; Hassam Paving Company, $19,682.75. Water street, E. R. Reid, $10,151.50; McDonald & McLeod, $9,445.50; B. Mooney & Sons, $7,652.50; Hassam Paving Company, $7,512.50. Pond street, McDonald & McLeod, $40,444; B. Mooney & Sons, $34,400.20; Hassam Paving Company, $33,558.40. The tender of Hassam Company was recommended for acceptance. Their total estimate amounted to $85,772.15; the engineer's estimate, $86,000. Under the terms of the contract work must be commenced June 15th, and completed September 1.

Toronto, Ont.

The Board recommends, subject to the approval of council, the aceptance of tender from the William Hamilton Company, of Peterborough, for the supply of hand-operated travelling crane for the waterworks filtration plant at the Island, at $1,035, the lowest.

The Board awarded the contract to the M. W. Kellog Company, of New York, for the erection of a brick chimney at the Water Works filtration plant at the Island, at $1,400. One other tender, $1.557.

Contracts for the construction of the following sewers were awarded as follows:—Boston avenue, $1,775; Don Mills road, $3,344; Gerrard street, $620; Hammersmith and Isleworth avenues, $499; Herbert avenue, $927; all to City Engineer, to be constructed by day labor. Also Hurndale avenue, Ellerbeck street to Jackman avenue, to the Forcott Contracting Company, $1,007; Hutchinson street, etc., Forcott Contracting Company, $867; Logan avenue, etc., to the Excelsior Construction & Paving Company, $2,977; Paton road, etc., city engineer; Playter Boulevard, etc., to the Forcott Contracting Company, $893; Playter Crescent, etc., to the Forcott Contracting Company, $1.227, all the lowest tenders.

The Board awarded the contract for the asphalt block pavement, John street, King street to Wellington street, to the Grant Contracting Company, at $4,595, the lowest. The City Engineer was awarded the contracts for bitulithic pavements on Balmoral avenue, Indian road, Manning avenue at $3,488, $4,317, and $5,578 respectively, the lowest in each case; also the vitrified block pavement on Lane, first east of Bay street, at $667.

Victoria, B.C.

On the recommendation of Angus Smith, city engineer, the contract to lay asphalt pavements on Linden avenue, Cooke street, Southgate street and St. Charles street, at a cost of $92,002,49 was awarded to the Worswick Paving Company. The Pacific Paving Company's figure for the entire work is $111,725.25, and the Barber Asphalt Company, $116,340.60.

Vancouver, B.C.

Evans, Coleman & Evans were awarded a contract for 1,600 feet of water pipe. The tenders were as follows: Evans, Coleman & Evans, for July delivery, $51.25 per ton; September delivery, $42.60. Robertson-Godson Company, July delivery, $52.60; September, $42.25. C. Gardiner, Johnson & Company, September delivery, $42.95.

Burnaby council accepted the tender of the Dominion Wood Pipe Company for the laying of pipe and the construction of a water tower for Edmond's waterworks system, the price being as follows: Supplying and laying 6 inch wood pipe, 45 cents per foot; 4 inch pipe, 32¼ cents per foot. Tank and tower on foundation to be built by council, $3,715.

Railroads, Bridges and Wharves

Armow, Ont.

Tenders will be received until June 15th for building cement concrete abutments and wing walls of bridge in the Township of Kincardine. Plans, etc., with R. B. Campbell, clerk.

Cornwall, Ont.

Tenders addressed to John Mullin, clerk of Cornwall Township, will be reecived until the 20th of June for the immediate construction of five reinforced structures on the South Branch Drainage scheme. Plans, etc., at office of Jas. A. Milden, C.E., Cornwall.

Chatham, Ont.

Tenders are being called until June 15th for the construction of two iron and concrete bridges. T. R. Clark, Commissioner, North Buxton.

Dublin Shore, N.S.

Tenders will be received until June 17th for the construction of a breakwater here. N. Tessier, secretary, Public Works Department.

Hawkesbury, Ont.

Tenders for the construction work of the C. N. R. from here to Montreal are now being called.

Liscomb, N.S.

Tenders are being called until June 24th for extension to the wharf. N. Tessier, secretary, Department of Public Works, Ottawa.

Lethbridge, Alta.

A line of railway from Cassils on C. P. R. main line to Bow City will be located. R. E. McArthur, consulting engineer.

Levis, Que.

Tenders are being called by the Department of Public Works, Ottawa, until July 5th for the construction of a deep water wharf here. N. Tessier, secretary.

Newmarket, Ont.

Following is a list of tenders received for the construction of a reinforced arch bridge of 60-foot span over the Holland river: Fraser & Clemens, New Hamburg, $3,300; John A. Watson, Laskey, $3,453; Rutherford & Patten, St. Catharines, $3,720; E. C. Lewis, Toronto, $3,996; Cement Products, Toronto, $4,190. Town council decided to do the work by day labor. Barber & Young, of Toronto, are the consulting engineers.

Ottawa, Ont.

The plans for the entrance of the C. N. R. from Toronto here have been filed with the Railway Commissioners for approval.

Salem, Ont.

Tenders are being called for materials for flat top bridge, township of Pilkington, etc., until June 17th. G. F. Cromar, clerk.

Stewart, B.C.

Tenders addressed to the Cassier Construction Company, Limited (W. H. Grant, general manager), will be received until June 10th for clearing, etc., of about 15 miles for the Portland Canal Short Line Railway.

Tadousac, Que.

Tenders are being called until June 29th by the Department of Public Works for the construction of wharf and approach here. N. Tessier, secretary.

Vancouver, B.C.

Tenders are being called by the head office, C. N. R., Toronto, until June 15th for the first sixty miles of the transcontinental line into British Columbia.

AWARDED.

Brockville, Ont.

The following tenders for six bridges were received:—Concrete throughout: (1) Hagerty & Company, $15,950; (2) W. M. Leacy, $16,790; (3) Elliott & Riley, $17,330; (4) Helmer & Wenstonley, $17,220; (5) J. E. Hayes, $18,180; (6) R. McManus & Company, $18,610; (7) Oakville Construction Company, $22,240. For concrete abutments, steel superstructures, the firms tendered in the same order as follows: (1), $15,950; (2), $16,760; (3) $17,200; (4), $17,600; (6), $18,750; (7), $21,590. Haggarty & Company were awarded the contract.

London, Ont.

Two reinforced concrete bridges on the Curry road, Adelaide, have been let for $445 to McLean, of Lucan. W. J. Harris, Kerwood, got the contract for culverts on the Strathroy road for $320. County Engineer Talbot has awarded the contract for steel superstructures for three bridges in London township to the Hunter Bridge & Boiler Works, of Kincardine, at $2,430.

Mount Hamilton, Ont.

F. Taylor & Bros., of Hamilton, were given a contract by this township for the construction of concrete bridges. Tenders were: F. Taylor & Bros., $6,405; Chas. Brayley, $6,855; Thos. Barnes, $7,000.

Montreal, Que.

The Grand Trunk Railway Company have awarded the contracts for a new rolling stock to the value of approximately $2,000,000 to the Canada Car Company, the Silliker Car Company, Halifax, N.S., while a portion of the work will be completed at their own shops, Point St. Charles. The order includes six first-class coaches, twenty baggage cars, one motor car, three buffet parlor cars, fifteen Richmond consolidated freight engines, twenty-five mogul locomotives, one thousand hopper bottom steel coal cars, capacity 100,000 pounds each, and five hundred steel under frame box cars, 60,000 pounds capacity each.

Oshawa, Ont.

W. G. Gibson, of Port Hope, was awarded a contract by East Whitby Township for the construction of two reinforced concrete bridges of 32 and 22 foot spans. Contract prices were $1,055 and $1,045. Bowman & Connor, consulting engineers, Toronto.

Tuscarora, Ont.

S. J. McKelvey, township clerk, Onondaga, writes that the contract for the construction of concrete abutments for steel bridge has been awarded to Wenger & Wenger, Springvale, at $7.15 per cubic yard. Other tenderers: Smith & Smith, Hartford, $8.50 per cubic yard; J. General, Cainsville, lump sum, $660.

Victoria, B.C.

The Pacific Construction Company secured the award for wharf extension work in this city at $4,333. Other tenders were: J. D. McDonald & Son, $4,497; W. McDonald, $4,673; Sheppard & Jones, $5,750.

Winnipeg, Man.

A contract has been let to Foley, Welch & Stewart for filling two miles of Rainy Lake with solid rock, bank wide, enough to carry double tracks, doing away with the old wooden trestle bridge. Several million dollars are involved.

Public Buildings, Churches, Schools, etc.

Brandon, Man.

The plans for the new fire hall, prepared by Architect W. A. Elliott, have been submitted to the council for approval. Plans call for solid pressed brick structure to cost $17,000.

The site for the new theatre, it is stated, has been purchased at corner of Tenth street and Princess avenue. Noted in last issue.

Brantford, Ont.

Tenders addressed to J. C. Walker, chairman of building, etc., committee of the Brantford Separate School Board, will be received until June 20th for the erection of a 6-roomed separate school to be erected corner of Pearl and Palace streets. Plans, etc., at office of Champman & McGiffin, architects, 201 Colborne street, Brantford.

Calgary, Alta.

Tenders are invited for the completion of city hall. Estimated expenditure, $126,000. J. T. Child, city engineer.

Canning, N.S.

Tenders are being received until June 20th for construction of church building. Plans, etc., with Rev. G. Crowell. E. M. Beckwith, secretary building committee.

Chilliwack, B.C.

It has been made necessary for the city to secure a site and erect a city hall and jail. A committee of citizens has been selected to secure plans and site for the new building.

Outlook, Sask.

Tenders were received until June 8th for the erection of 6-roomed brick school here. Plans, etc., at office of H. Mortimer Nelson, secretary, school board. R .G. Bunyard, architect, Moose Jaw.

Edmonton, Alta.

Tenders for ventilation and other mechanical equipment for Asylum Building, Ponoka, are being received until June 30th by the Department of Public Works. John Stocks, Deputy Minister of Public Works.

Fergus, Ont.

Sealed tenders will be received until 11th June for painting outside of high and public schools. J. A. Wilson, secretary, Board of Education.

Tenders for new post offices for Elora and Fergus will be called for in a week or so.

Guelph, Ont.

W. A. Mahoney is preparing plans and specifications for the remodelling of No. 5 school house. A new heating and ventilating system will be installed and other changes effected.

Hamilton, Ont.

The returns so far indicate that the by-law to spend $40,000 for House of Refuge for the County of Wentworth has been defeated.

Montreal, Que.

Plans and specifications have been prepared and tenders will be received until June 10th for the erection of a church building in the parish of St. Gotique, St. Henri. Messrs. MacDuff & Lemieux, architects.

Tenders were received up till June 6th for the construction of the First Presbyterian Church. Messrs. Hutchison, Wood, & Miller, architects. (Previously mentioned.)

Tenders have been received for the erection of additions to the Church of the Ascension, Park avenue and St. Viateur street, but no awards have as yet been made. Mr. H. C. Stone, architect.

Plans and specificatons are being prepared for the erection of a convent, sister's residence, on St. Urbain street, for the Hochelaga School Commissioners. Mr. Dalbe Viau, architect.

New Hamburg, Ont.

Plans are now being prepared for a new Lutheran Church here. J. S. Russell, of Stratford, is the architect.

Newmarket, Ont.

The ratepayers carried a by-law to spend $15,000 in enlarging the high school. The board will ask for tenders at once and will proceed with the enlargement this summer.

Oneida Indian Reserve, Ont.

J. D. McLean, secretary, Department Indian Affairs, will receive tenders until June 25th for the erection of a brick school house. For further particulars see "Tenders and For Sale Department" of this issue.

Ottawa, Ont.

Mayor Hopewell has received word that the Provincial Government is prepared to make a substantial grant towards the erection of a new dairy building for the Central Canada Exhibition. The building will cost $6,000, and at least $4,000 of this amount will be supplied by the province.

Weeks & Keefer, of Ottawa, have been appointed architects for the new Cumberland street fire station, which is to cost $15,000 in construction.

Tenders for supplying the civic corporation with an incinerator and garbage destroyer were submitted to the Board of Control and were referred to the Mayor, City Engineer and Controller Davidson for report. They were as follows: C. L. Trinimingham, Montreal, quoted $40,000 for a 75 ton a day incinerator of the Hughes and Sterling type. The General Supply Company, Ottawa, put in eight bids for a 75 ton Horsfall incinerator. The prices varying according to the style of feed, etc., were, $63,792, $72,503, $41,401, $44,044, $53,484, $30,429 and $39,869. Laurier & Lamb, Montreal, for the Heenan Froude style offered to furnish incinerators, 50 ton capacity, at $27,400 and $29,900 and 75 ton capacity at $32,150 and $34,660. Also one from the firm of Meldrum Bros., of Timperley, near Manchester, Eng., who offer to supply the incinerator for $29,935.

Plans, etc., for the erection of eastern departmental building addition can be seen, etc., at office of T. A. Hastings, clerk of works, Postal Station "F," Toronto, as well as at places previously mentioned in advertisement. N. Tessier, secretary, Department of Public Works.

Saskatoon, Sask.

A by-law will be voted on to issue $15,000 4½ 30-year debentures for the improvement and extension of the Exhibition grounds.

Competitive plans addressed to J. H. Trusdale, city clerk, will be received until June 30th for [illegible] city hospital, erection of a [illegible] hospital. Full particulars at [illegible]. W. Hopkins, mayor.

St. Catharines, Ont.

Tenders addressed to J. B. McIntyre, secretary, will be received until June 15th for the construction of a new wing to the St. Catharines General and Marine Hospital. Plans, etc., at offices of Langley & Howland, Toronto, or John G. Moore, 22 Queen street, St. Catharines.

Toronto, Ont.

Tenders are being called until June 10th by the Board of Education for enlargement of York Street School and alterations to [illegible] Avenue and George Street Schools and for repairs, etc.; also until June 13th for the enlargement of Earlscourt, Norway and Brown Schools and for iron stairs, etc. See advertisement in this issue.

A building permit has been issued to Howard Park Methodist Church for a 2-storey brick Sunday school; also to Law Society of Upper Canada for a 3-storey addition to Osgoode Hall.

The congregation of St. Jude's Church, Roncesvalles avenue, has decided to erect a larger church. A new grey stone church is proposed, of Gothic architecture, to cost about $50,000. Rector, Rev. J. L. P. Roberts.

The management of the First Reformed Presbyterian Church, now on Carleton street, have purchased a building site on Bloor east.

The Baraca Club is to put up a new building on Orchard street, at a cost of about $13,000. This is a club of young men, in affiliation with Gresvenor Street Presbyterian Church.

Vancouver, B.C.

The city council has decided to call for competitive plans for a steel frame office building on the site of the present city hall, costing about $750,000.

Victoria, B.C.

Tenders are being called until June 11th by the Department of Public Works for steel fittings for vaults, etc. F. C. Gamble, Public Works Engineer.

Virden, Man.

Tenders addressed to A. W. H. Smith, secretary-treasurer, S. D. No. 144, Virden, will be received until July 2nd for the purchase of $25,000 school debentures, etc.

West Toronto, Ont.

Tenders are being received by W. H. Cross, box 156, West Toronto, for completing two rooms and hall of school, on Alexander street.

Winnipeg, Man.

The 1914 centennial exposition by-law granting half a million dollars was carried. The voters defeated the by-law to grant $400,000 to the General Hospital, but carried a vote of $100,000 towards a tuberculosis hospital and $75,000 towards a hospital for infectious diseases.

Woodstock, Ont.

Over $10,000 has been subscribed for the erection of the new Chalmers Church, and a building site selected.

AWARDED.

Brantford, Ont.

We are informed that the contract for addition to Ryerson School was awarded to J. Faulkener, this city, and that for King Edward School to P. H. Secord & Sons, this city. Plans, etc., are being prepared for heating and plumbing.

Cayuga, Ont.

J. & J. Large, of Listowel, have received the contract for building a brick church for the Methodist Church here. W. E. Binning, of Listowel, furnished the plan and specifications.

Fredericton, N.B.

A contract has been let to M. Ryan & Sons for the erection of a new Catholic school building, brick and stone, in this city, to cost about $35,000.

Headingly, Man.

We are informed that the contract for the new school here has been awarded to J. B. Morrisson, Winnipeg, at $5,700.

London, Ont.

London Health Association have awarded the contracts for the physician's residence, the recreation and workshop, the laundry and pumphouse. Mr. John Nutkins was given the brick and cement work, Mr. John Purdom the carpenter work, and Sutherland Bros. the galvanizing and heating.

Montreal, Que.

The contracts for alterations to the Montreal Racket Club premises, Concord street, have been awarded as follows:—Masonry and brick work, John Wighton; alterations to sky-light, Geo. W. Reed & Company. Mr. H. C. Stone, architect.

Ottawa, Ont.

Tenders for the furnishing of four vault doors, and the installation of an elevator in the City Hall were as follows:—Vault Doors: Eadie Douglas Company, $322.50; J. & J. Taylor Company, Toronto, $340 (accepted); E. C. Arnoldi, $360. Elevator: The General Supply Company, Turnbull Elevator, $3,225 (accepted); the Otis-Fensom Company, $3,900.

Toronto, Ont.

The following tenders were accepted for the enlargement of Roden School:— Masonry, R. Chalkley & Son, $10,387; carpentry, W. Williamson, $8,965; reinforced concrete, A. Gardner & Company, $4,400; roofing and tinsmithing, George M. Bryan, $975; structural steel work, W. H. Salter, $995; plastering, T. Blackburn & Sons, $1,895; painting, Taylor & Company, $1,100; plumbing, Keith & Fitzsimons, $1,330; heating and ventilating, Keith & Fitzsimons, $5,600; heat regulating, Johnston Temperature Company, $860; electric wiring, Geo. J. Beattie, $80. The following tenders were also accepted for the erection of the new Elizabeth Street School:—Masonry, R. Chalkley & Son, $24,948; carpentry, Frank Armstrong, $9,789; reinforced concrete, W. Gardner & Company, $4,977; roofing, A. B. Ormsby & Company, $906; structural steel work, W. H. Salter, $2,300; plastering, T. Blackburn & Sons, $2,405; painting, James Phinnemore, $1,615; plumbing, Keith & Fitzsimons, $1,750; heating and ventilating, Keith & Fitzsimons, $6,000; heat regulating, Johnston Temperature Company, $800; electric wiring, Hall & Dollery, $65.

The Board of Control awarded the contract for plumbing work at St. Lawrence Hall to Fiddes & Hogarth at $447, the lowest.

The contract for roofing, etc., work on the new wing to Isolation Hospital was awarded to Geo. Sinclair at $2.950.

Westmount, Que.

Contracts in connection with the proposed extension of the Westmount library building were awarded by the Westmount City Council as follows: Excavation and masonry, Wm. McArthur, $5,900; carpentry, work, Shearer, Brown & Willis, $2,306; roofing, Westmount Plumbing & Heating Company, $345; plastering, Sanitary Tiling Company, $440; electric lighting, Westmount Plumbing, Heating Company, $50; tiling, D. R. Locker Company, $100; structural steel work, Structural Steel Company, $163; extra electric wiring, Henry Morgan & Company, $202. Mr. R. Findlay, architect.

Residences

Galt, Ont.

Plans for the changing of opera house into large apartment house have been received by Mr. James Scott, and call for a building of four storeys.

Guelph, Ont.

W. A. Mahoney, architect, is preparing plans for four new houses to be erected on Quebec street for Mr. Thomas Warren, of Toronto.

Hamilton, Ont.

J. Walter Gage has a parmit for brick dwelling, corner Main street and Carrick avenue, to cost $3,600.

London, Ont.

Building permits issued recently include: E. J. Padke, two storey residence, Richmond street north, $2,500; P. J. Watt, a 2 storey frame on Riverview avenue, $3,000, and William Ward, King street, an addition to his residence, $2,000.

Montreal, Que.

Mr. D. Blay is erecting a flat on St. Antoine street by day labor. Cost of permit, $12,000.

Tenders have been received for the erection of a residence for Senator Gilman. No awards have yet been made. Messrs. Hutchison, Wood & Miller, architects.

Plans and specifications are being prepared for the erection of three flats, Boulevard St. Joseph, for Mr. A. Duramleau. Mr. Dalbe Viau, architect.

Tenders are being received for the erection of a flat on Moreil street for Mr. R. Deschesne. Cost of permit $12,000. Mr. Dalbe Viau, architect.

Mr. A. Viens is erecting a flat on Ontario avenue for himself by day labor. Cost of permit, $10,000.

Tenders will be received until June 8th for the construction of a residence, Dorchester and MacKay streets, for Mr. J. B. Stephenson. House of Brown, Limited, architects.

New Waterford, N.S.

Chappell Bros. & Company, Sydney, N.S., have the contract for fifty-six cottages for the Dominion Coal Company.

Outremont, Que.

Recent building permits include: J. C. Walsh, Maplewood avenue, residence, $10,000; A. E. Fraser, Wiseman avenue, semi-detached cottages, $12,000; Donald Munro, Bloomfield avenue, cottages, $32,000; Robt. Ironside, West ward, cottages, $32,000; M. Drouin, Hutchison street, flats, $10,000; Delorimier Syndicate, Wiseman avenue, cottages, $8,000; A. E. Goseelin, McDougall street, residence, $5,200; G. H. Langridge, McDougall street, residence, $5,500; R. Neville, Bloomfield avenue, cottages, $2,100; C. Cousineau, Querbes street, cottages, $4,000.

Ottawa, Ont.

Mr. P. Labelle, 90 Church street, has purchased a large block of property, corner of Metcalfe and Gilmour streets, on which, it is stated, he will erect an apartment block.

Recent building permits include: A. M. Sutherland, brick apartment house, Besserer street, $6,000; J. B. Fraser, coachman's house and carriage shed, brick veneer, Frank street, $4,500; R. McGregor, brick veneer dwelling, Thornton street, $2,500; Clothier and Smith, brick veneer dwelling, Percy street, $2,500.

Stellarton, N.S.

Tenders for the erection of fifty double tenement houses for the Acadia Coal Company, Limited, will be received until June 25th. Plans, etc., at office of above.

Toronto, Ont.

Permit has been issued to G. A. Walton for 4-storey brick apartments on Hazelton avenue, $22,500.

Vancouver, B.C.

We are informed by the architects, Messrs. Wright, Rushforth & Cahill, that contracts for the modern apartment house to be erected by the Pacific Investment Corporation in this city will be awarded about June 26. Estimated total cost of building complete, $157,000.

Tenders are required for building stone foundation for Mr. Benjamin Willson's residence, Shaughnessy Heights. Plans and specifications may be seen at Parr & Fee's office, 570 Granville street.

AWARDED.

Montreal, Que.

The following contracts for alterations to the private residence of Mr. Eugene Payette, architect, have been awarded as follows: Masonry and brick work, Filion Freres; concrete, Canada Roofing Company; carpentering and joining, A. Mercure; plumbing, heating and roofing, H. A. Brosseau; wiring, R. Moncel Company; tiling, G. R. Locker Company, Limited. Plastering and painting not let yet. Mr. Eugene Payette, architect.

Contracts have been awarded as follows for the erection of a hall and flats for Mr. J. C. Cassels: Steel work, Dominion Bridge Company, Limited; plumbing, heating, roofing and wiring, Alex. MacKay & Company, Mr. James E. Adamson, architect.

Contracts have been awarded as follows for the erection of four houses to be erected in Outremont for Mr. Donald Munro, and others: Mason, brick and stone work, James Young, carpentering and joining, C. E. Frost; painting and glazing, F. X. Lavelle; plastering, H. Oram; roofing and damp proofing, Campbell-Gilday Company, Limited; plumbing and heating, D. A. Bethune. Mr. James E. Adamson, architect.

Contracts for the erection of a residence for Mr. A. J. Ferguson, Ontario avenue, have been awarded as follows: Painting, J. A. Alexander; masonry and brick work, J. H. Hutchison; carpentering work, U. Pauze & Fils Company; plumbing, A. Campeau. Mr. Kenneth G. Rea, architect.

The general contract for the erection of three houses in Westmount for Mr. W. W. Craig has been awarded to Messrs. Jackson & Company, contractors. Mr. James E. Adamson, architect.

Contracts have been awarded as follows by Mr. James E. Adamson, architect, for the erection of two houses in Outremont for Mr. Donald Munro: Mason and brick work, James Young; carpentering and joining, W. J. Moodie & Son; plumbing and heating, D. A. Bethune; plastering, H. Oram; roofing and damp proofing, Campbell-Gilday Company, Limited; painting and glazing, F. X. Lavalle; electric wiring, McDonald & Willson.

Toronto, Ont.

The Sanitary Flooring Company have been awarded the contract for laying composition flooring, etc., in Mr. Hoare's new apartment house on Maple avenue.

Walkerville, Ont.

Donaldson & Meier, Penobscot Building, Detroit, Mich., have let the general contract for the 3 storey and basement residence, 50 x 78, to be located in Walkerville for Tracey McGregor, 1724 Ford Building, to C. J. Keller & Company, 657 Canfield avenue E., Detroit. Cost $75,000.

Business Buildings and Industrial Plants

Brandon, Man.

Tenders for excavation for C. N. R. hotel and station building were called until May 30th. M. H. MacLeod, general manager, Winnipeg; local agent, R. Dickson.

Brantford, Ont.

A permit has been issued to the Union Realty Company for the erection of a 3 storey block of brick buildings, $17,600.

Collingwood, Ont.

The store owned by R. W. O'Brien was damaged on the 31st ult. to the extent of about $12,000.

Calgary, Alta.

Tenders are being received until June 8th for the construction of Calgary terminal station for Calgary Power Company, Limited. Smith, Kerry & Chace, engineers, Bank of B. N. A. Building.

It is stated that an English firm, to be known in this country as Pryce, Jones, Canada, Limited, have bought a block of land here. Cost of building estimated at $50,000.

Farnham, Que.

There is every prospect of a large industry being established in Farnham in the near future. It is stated that the Canadian Fairbanks Company and the Canadian Rand Company, Limited, are interested in the formation of a large company, which will utilize the extensive buildings vacated recently by the Canadian Pacific Railway Company. The ratepayers with this in view have authorized a by-law to raise $100,000 for the purpose of extending the local and municipal electric light system and for other necessary improvements. This work was under consideration some time ago, but was dropped at the time the Canadian Pacific Railway decided to remove their shops from Farnham.

Goderich, Ont.

Capt. Featherstonhaugh, superintendent of the Inland Navigation Company, is reported as having stated that the Company's boats will not land freight here unless proper freight sheds are provided.

Hamilton, Ont.

The National Fireproofing Company of Canada, Limited, will locate in Canada, with headquarters in this city, where 125 acres of land have been secured on which a plant will be erected to cost $1,000,000.

It is stated that arrangements for the merger of several of the large Canadian steel and iron industries have been completed, and that large additions will be made to the Hamilton Steel & Iron Company's plant here. The corporation will be known as the Canada Steel Corporation, and the capital is stated at $25,000,000.

Kemptville, Ont.

Buildings here to the value of about $50,000 were damaged on the 2nd inst. Geo. Ambridge, S. Hartnett and Constantine & Walker are among the losers.

Montreal, Que.

Plans and specifications are being prepared for a store and two dwellings, Ontario avenue, for Mr. Denis Messier. Mr. Dalbe Viau, architect.

The trunk factory of J. E. Fournier, corner of St. Lambert's Hill and Notre Dame street, was destroyed by fire on the [illegible] inst. Total estimated loss, [illegible].

Nanaimo, B.C.

Tenders addressed to Messrs. [illegible] McFarland & Proctor, Limited, Vancouver, will be received until June 16th for the erection of a brick office building here. Plans at office of the above and of A. E. Planta, Limited, Nanaimo, owners.

North Sydney, N.S.

The machine shops and forge of R. Musgrave & Sons, at North Sydney, were destroyed by fire on the 31st ult. Loss, about $20,000.

Orillia, Ont.

It is stated that a refinery to cost about $10,000 will be built here by American capitalists.

Ottawa, Ont.

The National Bag & Paper Company, now being organized, will locate their 3 storey brick factory on Wellington street. Work will start at once. President, J. B. Hennessy; W. H. Dwyer, managing director. Capital, $500,000.

Pictou, N.S.

The tannery at Lyon's Brook near here was destroyed by fire on the 3rd inst. C. MacDonald, Pictou, manager. Total estimated loss, $150,000.

Port Arthur, Ont.

The Western Drydock & Shipbuilding Company has under construction a $1,250,000 drydock and shipbuilding plant, which will necessitate a large amount of machinery, as there will be a complete boiler shop, rolling and punching shops, pattern shop and foundry. James Whalen, of Port Arthur, is the president, and there are large Cleveland interests of an American shipbuilding company in the organization. Noted in issue of March 23rd.

Quebec, Que.

The premises of the Hill Manufacturing Company, 60 St. Valier street, were damaged by fire on the 6th inst. to the extent of about $18,000.

Red Deer, Alta.

It is stated work will be started on the Bank of Commerce block. Noted in last issue, p. 29.

South Maitland, N.S.

The mills of the Anthony Lumber Company were destroyed by fire on the 5th inst. Total estimated loss, $90,000. A. S. Horsley, New York City, is chief owner.

Saskatoon, Sask.

Campbell, Wilson Company, Winnipeg, Man., have decided to locate a branch here. It is stated that the intention is to build a block as soon as possible on one of the sites on which Mr. Wilson has secured option. Estimated expenditure, $40,000.

The Dominion Bank of Canada has purchased a Second avenue site, 50 x 125 feet. It is expected that a start will be made this year with the building, which is to be three storeys.

Sault Ste. Marie, Ont.

The plant of the Northern Foundry & Machine Company was destroyed by fire on the 2nd inst. Total estimated loss, $30,000.

Toronto, Ont.

The T. Eaton Company have a permit for a five storey warehouse and garage on Albert street, $63,000.

The Government House property has been purchased by the C. P. R., and it is stated that the company will erect thereon an office building and freight sheds.

The Canadian National Carbon Company has a permit for a one storey brick factory on [illegible] road, $[illegible]. [illegible] Telephone Company has permit for a [illegible] storey brick telephone exchange, [illegible] avenue, $40,000.

Victoria, B.C.

It is reported that the Moline Pump Company, of Moline, Ill., are negotiating to locate a Canadian branch here.

Vernon, B.C.

Plans for the new C. P. R. station have been approved by the Board of Trade committee and forwarded to Supt. Kilpatrick. Plans call for a station of brick and concrete to cost $12,000.

Vancouver, B.C.

A new hotel to cost at least $750,000 may be erected here by Messrs. Charles J. [illegible] and D. Swinhart, president Hotel Financing Company, Seattle. They have been looking into the question of sites.

It is stated that the Hidden Creek Mining Company are completing arrangements for the building of a smelter adjacent to its properties at Goose Bay, Observatory Inlet, Portland Canal District. Construction will likely start this summer. Estimated expenditure, $50,000. M. K. Rodgers, of Seattle, Wash., president; Mr. Thomas Hodgins, banker, New York, is interested.

It is announced that the C. P. R. has bought the Railway Block on Hastings street, between Homer and Richards streets, on which, on the expiration of the present leases next spring, extensive alterations and additions will be made.

Winnipeg, Man.

McLaren Bros., proprietors of Strathcona Hotel, have purchased property corner of Main and Rupert streets, on which it is stated they will erect a 7 storey hotel. Plans are not yet completed.

The Union Bank of Canada has secured a permit for the erection of a branch bank, southeast corner of Logan and Nena. The Ogilvie Flour Mills Company filed plans and got a permit for a $6,000 addition to the Higgins avenue mills. M. Lechtzier was given permission to construct a $15,000 warehouse on the north side of Logan avenue, between Main and King.

The permit for the T. D. J. Farmer office building, to cost $113,000, has been issued. It will be of steel, cement, stone and brick and absolutely fireproof. The plans show a four storey block with stone front. Architect, W. W. Blair; contractors, C. W. Sharp & Son.

A permit for a $25,000 addition, 49 x 99, 3 storey, to the warehouse of the A. Macdonald Company, to be erected on Market street between Bertha and Louise streets. It will be constructed of brick, stone and concrete.

AWARDED.

Guelph, Ont.

W. A. Mahoney, Guelph, was awarded the contract for a butter factory, work on which has been started. It will be 3 storeys high, of solid brick, 40 x 70 feet.

Montreal, Que.

Contract for the reinforced concrete and millwork construction on a new factory for the Holland Varnish Company, Limited, has been awarded to Geo. W. T. Nicholson, general contractor. T. Pringle & Son, Limited, architects.

Mr. E. G. M. Cape has been awarded the contracts for alterations to the premises of the Dougall Varnish Company. Mr. A. F. Dunlop, architect.

Contracts for the erection of the new ten storey Yorkshire building to be erected on St. James street, has been awarded to Messrs. Peter Lyall & Sons. It is to be completed by March 1st, 1911 and will be fireproofed throughout.

Quebec, Que.

Messrs. Bosse & Banks, this city, have the contract for the supply of steel and cement for the new building of the Union Commerciale, the Dominion Fish & Fruit Company's cold storage building and the Kent House extension.

Stratford, Ont.

The tenders for the new Bell Telephone Company's office have been let as follows: Brick work, concrete work and carpentering, Pounder Bros.; painting, A. E. Cash; electric wiring, F. C. Whatmough; plumbing and heating, J. R. Myers; roofing, F. Bloxam; plastering, E. Soeder.

St. John, N.B.

Architect F. Neil Brodie, who has charge of the remodelling of the Montgomery building in King street for W. H. Thorne & Company, has awarded the contract to J. Medley Belyea, of Carleton, who in turn has sub-let the contract for the mason work to R. A. Corbett. The work, it is expected, will be completed about August 18.

Toronto, Ont.

The contract for building the new station of the C. P. R. at North Parkdale has been awarded to Walls & Grey, Limited, of Toronto.

Contract for the roofing and sheet metal work on the Canadian Linseed Oil Mills, Limited, building has been awarded to A. B. Ormsby, Limited.

Winnipeg, Man.

The contract for the Farmer Block, Main street, has been awarded by W. W. Blair, architect, to Charles W. Sharp & Son at $125,000, and the building to be constructed by November 1.

For the erection of Northern Crown Bank R. Watson has secured the general construction contract and, it is stated, the Dominion Bridge Company, Limited, the erection of the steel and furnishing the same. The contract price is about $100,000, and the steel contract represents an outlay of $7,000.

Power Plants, Electricity and Telephones

Bowmanville, Ont.

The by-law for municipal ownership of the Bowmanville Electric Light Company was carried.

Calgary, Alta.

Tenders are being invited for a telephone conduit system to cost about $40,000. Smith, Kerry & Chace, engineers, Bank of B. N. A. Building.

Coquitlam, B.C.

An order-in-council has been passed confirming the long-pending agreement between the Minister of the Interior and the Vancouver Power Company for the construction of a dam and plant at Coquitlam for power purposes.

Medicine Hat, Alta.

M. A. Maxwell has reported favorably on the installation of a municipal electric light and power plant, at an approximate cost of $50,000.

New Hamburg, Ont.

The by-law for the purpose of taking over the local electric plant owned by J. Morley for $8,000 was carried, and also that to grant the People's Electric Railway a franchise for 25 years.

Ottawa, Ont.

President Jenkins of the Metropolitan Power Company came to Ottawa from Petrolia last week, and had survey work started on the company's property at the Deschenes rapids, at Britannia village, six miles from this city. The president states that it is the intention to make an early start in the work of constructing a plant for the development of power.

Peterborough, Ont.

J. H. Larmonth, managing director of the Peterborough Light & Power Company, is the authority for the statement that his company has purchased the dam at Auburn, above which a new dam and power house will be constructed to cost about $125,000.

Quebec, Que.

Tenders addressed to J. F. Guay, consulting engineer, will be received until June 10th for the construction of a concrete dam at St. Alban, on River St. Anne, for the Deschambault Electric Company.

Victoria, B.C.

Tenders will be received until June 13th for supply of lamps, transformers, switchboards, etc., for arc light equipment. W. Northcott, purchasing agent.

Winnipeg, Man.

The Board of Control recommended letting of the contract for the cooling tower in connection with the power plant terminals to Ferdinand Bauer, of St. Louis, at a cost of $3,380. W. G. Chace, engineer in charge.

AWARDED.

Brantford, Ont.

Grand Valley Railway Company (Wm. P. Kellett, chief engineer) is stated to have awarded contracts to the Warren Bituminous Paving Company and to P. H. Secord & Sons, Limited, for the construction of 11 miles of single track in Brantford. It is intended to use 80-lb T-rails and white oak ties laid in 12 inches of concrete.

Longueuil, Que.

The corporation of Longueuil have been authorized to raise $35,000 for municipal improvements, including the installation of an electric lighting plant and installation of an electric water pumping system, at a cost of $24,000. A steam road roller, stone crusher and motor will be purchased at an approximate cost of $6,000. City sheds will be erected to cost $800, while $3,600 will be invested for quarry supplies.

Winnipeg, Man.

M. Peterson, secretary, Board of Control, confirms the items published in last issue concerning the award of conduit, erection of sub-station, etc., and also states that G. M. Gest, Montreal and New York, has been awarded the contract for construction of conduit runs at the unit prices stated in said tender.

Miscellaneous

Halifax, N.S.

The Department of Public Works and Mines is calling for tenders until June 18th for supply of paint, etc. Hiram Donkin, road commissioner.

Montreal, Que.

Recent building permits include:—R. Dechesne, 20 St. James, one house containing nine dwellings, $12,000; E. Desmarais, 287a St. Denis, one house containing three dwellings, $4,000; H. B. Walker, Bank of Commerce, one residence, $18,000; N. Depatie, Christopher Colombus, one house containing three dwellings, $3,500; J. Rovalls, 1642 Cadieux street, one house containing two dwellings, $3,000; N. Desautels, 48 Demontigny east, four dwellings and two stores, $4,500; B. Chalut, 715 Fullum, two houses containing six dwellings, $6,000; A. Viens, 1904 Cartier, four houses containing twelve dwellings, $10,000; A. Longon, 1764 Notre Dame west, one house containing three dwellings, $3,000; A. T. Timmers, 74 Villeneuve, one house containing three dwellings, $3,500; A. Desmarteau, 456 Chambord, one house containing three dwellings, $2,500; H. Pelsdeaux, 189 Amherst, one house containing two dwellings, $5,600; D. Blay, 89 Dagenais street, four houses containing twelve dwellings, $8,000; E. D. Berthelet, 599 Mount Royal, one house containing three dwellings and one store, $7,000; M. Signac, 125 St. Edward, one house contaning three dwellings, $3,000; A. Landry, 192 Gauthier, two houses containing six dwellings, $6,000; C. Bastien, 11 Laurier street, two houses containing six dwellings, $6,000.

Ottawa, Ont.

Tenders for dredging Mimamichi Bay, N.B., will be received by the Public Works Department until June 9th.

Tenders are being received until July 20th for construction of steel dredge for British Columbia. N. Tessier, secretary, Department of Public Works.

Toronto, Ont.

Recent buildings permits include: J. E. Peterkin, 1 pair semi-detached 2-storey brick dwelling, St. Clarens, $4,000; Allman & Smith, 1 pair semi-detached 2-storey brick dwelling, Perth, $4,000; J. S. Hedge, 1 pair semi-detached 2-storey brick stores and dwellings, and one attached 2½-storey brick dwellings, McCormack and Weston road, $7,000; H. H. Brown, 1 pair semi-detached brick dwelling, Perth, $4,000; R. W. Burgess, 2-storey brick dwelling, Castle Frank Crescent, $5,500; W. J. Bennett, 1 pair semi-detached, 2-storey and attic brick dwellings, Kendal avenue, $5,500; C. P. Playter, 2-storey brick dwelling, 136 Tyndall avenue, $4,800; Weismiller & Mackenzie Bros., 1 pair semi-detached Pearson & Macdonnell, $5,000; J. S. Sharpe, 3-storey brick store and dwelling, Roncesvalles, $5,000; C. J. Powley, 1 pair semi-detached 2-storey brick stores and dwellings, Dundas, $6,000; L. Moneypenny, 2½-storey brick dwelling, Dunvegan road, $5,500; W. L. Marshall, 1 pair semi-detached 2½-storey brick dwelling, Gladstone, $5,000; G. McWilliams, 3 detached 2-storey and attic brick dwellings, Beresford, $9,000; Wm. Dunseath, 1 pair semi-detached 2-storey brick dwellings, Thorne, $4,000; J. J. McCaffery, 3-storey brick addition to hotel, Adelaide and Bay, $10,000; J. L. Havill, 2-storey brick warehouse, on Adelaide W., $16,000; F. L. Beecroft, 1 pair semi-detached 2-storey and attic brick dwellings, Wilton crescent, $9,000; Jas. Delworth, 3 attached 2-storey brick dwellings, Adams avenue, $6,000; Star Publishing Company, 1-storey brick addition, to printing office, King street west, $13,000; Rev. R. M. Hamilton, 2½-storey brick dwelling, Highland avenue, $7,500; E. J. Freysing, 2-storey brick dwelling, 90 Roxborough street east, $6,000; W. H. Carrick, 2½-storey brick dwelling, 9 Crescent road, $18,000; E. Hudson, 1 pair semi-detached 2-storey brick dwelling, Hallam, $4,000; J. E. Peterkin, 1 pair semi-detached 2-storey brick dwelling, Leslie, $4,000; H. E. Simpson, 2 pairs semi-detached 2½-storey brick dwelling, Dufferin, $8,000; John Houden, 2 detached 2½-storey brick dwelling, Walter street, $6,000; Mission Building, 1-storey brick addition to Mission, corner Elm and Teraulay, $6,000; W. W. Hiltz, 2½-storey brick dwelling, 41 Hogarth avenue, $4,500; H. Wright, 2 pairs semi-detached 2½-storey brick dwellings, Pearson and Roncesvalles, $10,000; C. P. R., 1-storey brick freight shed, on Marlborough avenue, $[illegible],000; W. H. McDonald, 2-storey and attic brick dwelling, Glendale, $4,000; F. H. Bible, 2½-storey brick dwellings, 1 pair, semi-detached, Logan, $5,000; Mrs. L. B. Hall, 1 pairs semi-detached 2-storey brick dwellings, Dufferin, $4,000; J. B. McLeod, 3-storey brick dwelling, Russell Hill road, $6,000; John Boyd, 2½-storey brick dwellings, southeast corner Russell Hill road and Heath street, $10,000; F. M. Tuckett, 3 detached 2-storey brick dwellings, Woodville avenue, $7,500; S. J. Gee, 2-storey brick dwelling, Hallam, $4,000; C. Bulderton, 1 pair semi-detached 2½-storey brick dwellings, Sinclair, $7,000; Sisters of St. Joseph, 1-storey brick boiler house, Breadalbane street, $8,000; S. R. Dewar, 1 pair semi-detached 2-storey brick dwellings, on Symington, $4,000; G. Brady & Son, 3 detached 2-storey and attic brick dwellings, on Woodlawn, $18,000; W. J. Grant, 1 pair semi-detached brick dwellings on north side Virtue street, $4,000; Jackson & Brooks, 1 pair semi-detached 2-storey and attic brick dwellings, on east side Fairview, $5,000.

Victoria, B.C.

Recent building permits include: E. B. Jones, for a store and dwelling on North Park street, to cost $4,200; William Bayliss for a dwelling on Fairfield road, to cost $3,200; B. C. Land & Investment Agency, for alterations to the building adjoining the Law Chambers, Langley street, to cost $2,500; Rev. T. H. and Mrs. Lett, for a frame and concrete eight-room dwelling, on Simcoe street at $4,000.

Vancouver, B.C.

Recent building permits include: S. A. Stuart, frame dwelling, 962 Eighth avenue west, $6,000; J. Z. Hall, stone veneer dwelling, 2890 Point Grey road, $8,000; Archibald York, frame stable, Davie street, $3,000; B. T. Rogers, stone addition to dwelling, Davie and Nicola street, $10,000; Adamson & Main, brick building, C. P. R., reserve (foot Davie), $35,000; W. E. Morrison, frame building, 2555 Third avenue west, $4,000; A. C. Hirshfield, 1963 Comox street, $4,675; E. Beam, 941 Semlin drive, $2,500; Bank of Vancouver, 167 Hastings street, $2,000; Mrs. J. Boyd, 2705 Second avenue west, $2,700.

Winnipeg, Man.

Recent building permits include: J. W. Parker, two dwellings, south side Beresford between Nassau street and John street, $4,000; J. P. Lipp, dwelling, east side Strathcona between Portage avenue and Classic, $3,100; Forseng & Munsen, two dwellings, east side of Arlington between Portage and Preston avenue, $4,000; West End Realty Company, dwelling, east side of Aubrey between Bath and Buell, $3,000; J. Y. Griffin & Company, Limited, boiler house, south side of Vaudreuil, $2,000; also factory in same location, $8,000; G. J. Clint, dwelling, south side of Wolseley, between Maryland and Walnut, $6,800; J. G. Kimmel, southeast corner of Lulu street and Henry avenue, terrace of 6 dwellings, 98 x 32, two stories high, $10,000; Copping Bros., dwelling, south side Buell avenue, between Maryland and Walnut street, $5,800; John Granberger, house, south side of Rosser, between Hugo and Helen, $8,000; W. P. Davidson, two houses, east side of Arlington, between Preston and Bath, $6,000; Manitoba club, addition, $3,000.

Ornamental arches to cost not more than $12,000 will be erected on Armstrong's Point. Col. Ruttan is interested.

AWARDED.

Toronto, Ont.

The contract for the supply of lumber required by the Property Dept., City Hall, was awarded to Kelly & Company, this city.

Tenders have been received and opened for the construction of concrete work, etc., in connection with the sea wall in front of the Exhibition Grounds, etc., and contract, awarded to Peter Arnot, at $17.40 per running foot.

Design and Size

A common foible of architects(or perhaps of their clients) is hit by a writer in an American contemporary when he remarks that "it is a very comfortable thing to see a village hospital that does not look like a child's size imitation of a city one." The remark is of fairly general application. In our own country, however, the rural hospital does not usually come under the implied condemnation. The so-called cottage hospital usually has quite a distinctive character of its own, and is by no means a miniature hospital. On the other hand, one has often to deplore the small library, or town hall, or church, or suburban villa that is palpably and grossly out of scale, and miserably fails to please because it so strongly suggests the frog trying to inflate himself to the dimensions of a bull. No doubt the architect often perpetrates these monstrosities at the urgent demand of the client; the former well knowing the important relationship between design and size. Another matter in which the architect of small buildings is often hampered and embarrassed is that of the sizes of materials, mainly decorative. He finds that the particular detail he requires is made in only one size, which may be appropriate for a mansion, but is too large for a villa. Manufacturers should make a note of this. In some instances it might be possible for them to standardize their materials in the same way that printers standardize their types, one size bearing a definite proportional to another, so that, occasionally, the various sizes could be used in conjunction. This, however, is a separate matter from suiting the design to the size—Builders' Journal (Canadian).

Reinforced Concrete Wall Construction

A separate unit type of reinforced concrete wall construction was used last year in building the power house of a small hydro-electric plant to Newton Falls, Ohio. The pilasters are of monolithic concrete, while the walls between them are hollow and are built of inside and outside thin concrete slabs, which were set before the pilasters were poured, so as to be keyed into them. The slabs were reinforced with No. 28 gauge expanded metal and were made in sizes that could be handled conveniently. Their outer surfaces were corrugated by laying 5-8 inch round rods in parallel lines on the surface of the fresh concrete when the slabs were cast and pulling them out after the mixture had taken its initial set. These corrugations were designed to give a good bonding surface for the plaster coat which was applied to the walls after they had been erected. The slabs were allowed to cure and were then placed on edge in proper position. Vertical form boards were placed for the pilasters, extending beyond the surface for the monolithic work, so that the slabs rested against them. The inside faces of the pilasters were moulded against form boards placed in the air space between the wall slabs, and were wired to the outside forms after the pilaster reinforcement had been placed. The inside boards also served as spacers to keep the slabs the proper distance apart. The distance varied somewhat, but 8 inches was the minimum.

Tenders and For Sale Department

Town of Walkerville

Tenders for Sidewalk

Sealed tenders will be received, addressed to the undersigned up to noon on TUESDAY, THE [illegible] DAY OF JUNE 1910, for the construction of a granolithic walk on the east side of [illegible] street south of Niagara (about 2,000 square feet), in the Town of Walkerville.

Plans and specifications may be seen on application to Mr Owen McKay, C.E., Walkerville.

CECIL H. ROBINSON,
Town Clerk, Walkerville.

To Architects

Competition Plans

The Board of Management of Knox College, Toronto are desirous of obtaining plans for their proposed new College Buildings to be erected on St. George Street to the westward of the Lawn of the University of Toronto.

Conditions of Competition, with all information, can be had on application to the Rev, John Sommerville, Confederation Life Building, Toronto.

Plans must be sent by the FIRST OF NOVEMBER NEXT. 23

Ottawa—Eastern Departmental Building—Addition

Contractors are hereby notified that the plans and specifications for the above work can be seen and forms of tender obtained at the office of Mr. T. A. Hastings, clerk of works, Postal Station "F," Toronto, as well as at the places mentioned in the advertisement dated May 18, [illegible]

By order,
NAPOLEON TESSIER,
Secretary.

Department of Public Works,
Ottawa, June 1, 1910. 23

Tenders Wanted

Sealed tenders addressed to the Secretary, Department of Indian Affairs, Ottawa, and endorsed "Tender for Oneida School-house," will be received up to noon of the 25TH OF JUNE, 1910, for the erection of a brick school-house on concrete foundation for the Oneida Indian Reserve, Ont.

Plans and specifications may be seen at the Post Office, St. Thomas, the Post Office, London, and the Office of the Indian Agent, Delaware.

The successful tenderer will be required to furnish a bond in satisfactory sureties for a sum equal to the amount of the contract.

The lowest or any tender not necessarily accepted. The unauthorized insertion of this advertisement in any paper will not be paid for.

J. D. McLEAN,
Secretary.

Department of Indian Affairs,
Ottawa, May 27, 1910. 24

Tenders for Pavement

Sealed tenders will be received by the City Clerk of the City of Guelph, until 5 p.m., on FRIDAY, JUNE 10TH, 1910, for approximately 11,700 square yards of Bituminous Pavements.

Plans and specifications may be seen, and instructions to bidders and forms of tender obtained at the office of the City Engineer,

Tenders will be received for the concrete base and curbs, and the surfacing, separately.

The lowest or any tender not necessarily accepted.

JAMES HUTCHEON,
City Engineer.

Guelph, May 21st, 1910. 23

Tenders for Concrete Sidewalks, etc.

The Corporation of Port Hope invite tenders for the construction of five lineal miles or thereabouts of Concrete Sidewalks and Crossings, with the necessary works connected therewith, in accordance with detail and specifications prepared therefore, copies of which, with forms of tender, may be obtained on application to the undersigned. A marked cheque equal to five per cent. of the gross amount of the contract to be furnished with each tender, and the lowest or any tender not necessarily accepted. Tenders received to 13TH JUNE, NOON.

J. W. SANDERS,
Town Clerk.

Dated, 25th May, 1910. 23

Notice to Architects

Competitive designs for a Residence for the Lieutenant-Governor of the Province of Ontario, proposed to be erected on Bloor Street, in the City of Toronto, will be received by the undersigned at the Department of Public Works, Parliament Buildings, Queen's Park, Toronto, up to noon on the 15TH DAY OF JULY NEXT,

Information and particulars as to the extent and character of the said designs can be obtained upon application to the office of the Secretary of Public Works.

Subject to such terms, conditions, etc., the following premiums are offered:

For the design most approved......	$1,000.00
For that approved as second in merit	500.00

The designs for which said premiums will be awarded are to be selected and approved of by the undersigned, and the same are thereupon to become the property of the Province.

J. O. REAUME,
Minister of Public Works.

Department of Public Works, Ontario.
Toronto, May 12th, 1910. 23

Tenders for Sidewalk

Tenders will be received by the undersigned up to JUNE 15TH, 1910, for the laying of 25,000 feet of Cement Sidewalk in the Town of Uxbridge. Specifications may be seen at the Clerk's Office, work to be commenced by the 1st of July, 1910. The lowest or any tender not necessarily accepted.

M. H. CROSBY,
Town Clerk.

23

Tenders for Concrete

The undersigned will receive tenders for the construction of $2,500 worth of walks and crossings, until MONDAY, THE 13TH JUNE NEXT, at 8 p.m.

For specifications apply to me. The lowest or any tender not necessarily accepted.

D. H. MINAKER,
Town Clerk.

Cobourg, 30th May 1910. 23

Board of Education

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board will be received for the

Enlargement of York Street School, Alterations to Coleman Ave and George Street Schools

and for

Midsummer Repairs, Fuel and Furniture, Window Shades, Linseed Oil and Turpentine

until

Friday Noon, June 10th, 1910

and for the enlargement of

Earlscourt, Norway and Brown Schools

also for

Iron Stairs for Several Schools

until

Monday Noon, June 13th 1910.

Plans and specifications may be seen and all information obtained at the office of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in said specifications and forms of tender. The lowest or any tender will not necessarily be accepted.

W. H. SMITH, Chairman of Committee.
W. C. WILKINSON, Sec.-Treas.

23

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra.

CIVIL ENGINEER, Good Organizer, full control of all grades, and labor. Just completed large Water Power Development six months ahead of time, is open for engagement.—Box 981, CONTRACT RECORD, TORONTO. 23

Positions Vacant

Advertisements under this heading two cents a word per insertion.

WANTED—TRAVELLING SALESMAN to represent firm manufacturing bank, office and store fittings. Must be competent to make sketches, etc. Man having experience in architect's office preferred. Apply, Box 974 "Contract Record," Toronto. TF

WANTED—FOREMAN BRICKLAYER, must be thoroughly conversant with heavy masonry work, understand plans and details, a pusher, sober, capable of getting a good day's work out of his men. We desire a man who wishes for a permanent position in this city. Salary no object, and assistance in transportation if necessary to the right man, but we want the best man obtainable. Write, enclosing references, to The Edinger-Nesbitt Construction Company, Edmonton, Alberta 23

Miscellaneous

Advertisements under this heading two cents a word per insertion.

PINE PILING—Can supply large quantities pine piling, any length up to, say, 70 feet, on cars C. N. O. R. Apply to A. Prentice, 649 Bathurst Street, 'Phone College 5729, or A. McPHERSON & COMPANY, Longford Mills, Ont.

NINE-ACRE BRICK CLAY PLOT—The very best situation; close to town and a market for all you can make; will sell outright or will take partner with $3,000; this is a rare chance for anyone wishing a paying business right from the start. Write S. W. Fawcett, P. O. Box 384, Sault Ste. Marie, Ont. 23

New Companies

Waterproof Products, Limited, Montreal, Que., capital $250,000. Incorporators, John J. Robson and John H. Brittle, advocates, Montreal, Que.

George B. Prowse Range Company, Limited, Montreal, Que., capital $50,000. Incorporated to carry on business as plumbers, gas and steamntters, general contractors, etc. Incorporators, Chas. C. Prowse, superintendent, and Achille Verschuere, foreman, both of Montreal, Que.

The Cobalt Smelter, Limited, Montreal, Que., capital $2,000,000. Incorporators, Norbert Brunet, student at law, and Joseph J. Bouchard, accountant, both of oMntreal, Que.

The Laurentian Chemical Company, Montreal, Que., capital $590,000, incorporated to produce and dispose of products and by-products obtained by the distillation of wood, etc., and to carry on the lumber industry. Incorporators, A. D. Gall, Westmount, Que., R. Prefontaine, F. E. Lovell, all of Montreal.

The Blaugas Company of Canada, Limited, Montreal, Que., capital $3,500,000, incorporated to take over the business carried on by Blaugas Company of Canada, and to manufacture, etc., all kinds of gas, electricity. Incorporators, Mortimer Barnett Davis and J. A. Jacobs, gentlemen, R. C. Smith and F. H. Markey, K.C., all of Montreal.

The Granville Power Company, Limited, Ottawa, Ont., incorporated, capital $1,500,000. Incorporators, F. H. Chrysler, C. J. R. Bethune, N. G. Larmonth and R. V. Sinclair, solicitors, all of Ottawa.

The Enterprise Gas Company, Limited, Delhi, Ont., capital $100,000. Incorporators, Sherman Stout and [illegible], manufacturers, Delhi, Ont.

The Halton Telephone Company, Limited, Hornby, Ont., capital $10,000. Incorporators, Hiram E. Tuck, farmer, and G. A. Kennedy, grain dealer, Hornby, Ont.

The Crown Electrical Manufacturing Company of Brantford, Canada, Limited, Brantford, Ont., capital $200,000. Incorporators, Wm. D. Schultz, contractor, and John S. Dowling, insurance broker, both of Brantford, Ont.

United Paper Mills, Limited, Toronto, Ont., capital $40,000. Incorporators, Morley P. Wilkins, accountant, and R. I. Finlay, merchant, Toronto, Ont.

The Canadian Consolidated Mining, Lumber & Utilities Company, Limited, Toronto, Ont., capital $4,000,000. Incorporators, W. C. Coleman, accountant, and H. S. Pritchard, barrister-at-law, Toronto, Ont.

J. R. Eaton & Sons, Limited, Orillia, Ont., capital $100,000, incorporated to carry on the business of lumber and timber merchants, builders and contractors. Incorporators, Jas. R. Eaton and Edwin R. Eaton, manufacturers.

Great Western Cement & Gravel Company, Limited, Toronto, Ont., capital $250,000. Incorporators, Wm. Gilchirst, solicitors' clerk, and James Stewart, accountant, both of Toronto, Ont.

Miller, Limited, London, Ont., incorporated to manufacture, sell and deal in all kinds of plumbers' supplies, etc. Incorporators, A. E. Somerville, manufacturer, and Thos. Rich, plumber, both of London, Ont.

Canadian Sanitary Manufacturing Company, Limited, Montreal, Que., capital $1,000,000, incorporated to carry on the business of manufacturers of and dealers in sanitary apparatus, plumbers' supplies, etc. Incorporators, Arthur J. Thomson and Wm. S. Symon, solicitors, both of Toronto, Ont.

The Empire Paper Box Company, Limited, Montreal, Que., capital $49,000, incorporators, Anthony H. Sims and James R. Gordon, manufacturers, Montreal, Que.

The Canadian Hardwood Company, Limited, Toronto, Ont., capital $490,000. Incorporators, Stratchan Johnston and Reginald Holland, solicitors, Toronto, Ont.

Taylor & Arnold, Limited, Montreal, Que., capital $50,000, incorporated to carry on business as dealers in railway, mining and contractors' supplies, machinery, etc. Incorporators, Arastus E. Howard and Henry U. Sylmer, advocates, Montreal, Que.

The Empire Contsruction Company of Canada, Limited, Toronto, Ont., capital $200,000, incorporators, John C. Sherry, barrister at law, and Norman G. Lindsay, bookkeeper, both of Toronto.

The Durbin Automatic Safety Car Coupler Company of Canada, Limited, Sarnia, Ont., capital $1,500,000, incorporators, James F. Durbin, Fort Scott, Kansas, and Robt. I. Towers, barrister at law, Sarnia, Ont.

The Toronto Kiln Dried Lumber Company, Limited, Toronto, Ont., capital $40,000, incorporators, Robt. S. Wilson, merchant, and Wm. D. Wilson, manufacturer, both of Toronto, Ont.

Pleasing the Owner

If the plans are changed in any material [illegible] one that can be in a measure a preventive [illegible] plan will work out until they see the same [illegible] ideas are often totally at variance with the plans they had first conceived. It would [illegible] and this can be done, provided there is some diplomacy used as the work progresses.

It sometimes happens that the plans are so complicated, to the builder of a structure, that the same will have a very great difference in the completed building, and as the work goes forward the owner should be permitted to make inspections at intervals, so that there will be less cause for differences when the contract has been completed. There is wisdom in sometimes making an effort to please even the crank, and in order to do this there should be taken into consideration in advance of any actual work at least a general conception of what the final outcome will be, so that there can be less opportunity for the builder to make unreasonable demands for changes that are not so specified in the contract.

Reinforced Macadam Pavements

A new system road construction, designed to resist the destructive pneumatic effect of automobile tires, has been under test for some time at Gennevilliers, a suburb of Paris. This construction, devised by M. Guiet, and destribed in a recent issue of "Le Genie Civil," consists in part of a foundation of concrete about 2 inches thick. Upon this foundation and along its length are laid No. 6 steel wires and steel strips 1 1-4 inches x No. 14 gauge, set edgewise. The steel strips are spaced 2 feet apart and the No. 4 wires lie at a distance of 8 inches from each side of these strips. At longitudinal intervals of 8 inches each vertically placed steel strip is looped around with a No. 9 steel wire, the ends of which are hooked around the No. 6 wires at each side. Over this reinforcement is spread a thick layer of cement mortar, in which broken stone is carefully imbedded. On its surface the road resembles an irregular stone paving with cement joints. The cost ranges from $1.25 to $1.40 per square yard of surface, which, it is thought, is not more than the cost and maintenance of ordinary macadam for a term equal to the life of the reinforced road.

J. N. Laine, painter, Montreal, Que., Mrs. Joseph Laine registered.

Fullerton Bros., plumbers, Toronto, Ont., are stated to be closing their business.

Leblanc & Aquin, contractors, Lachine, Que., are stated to have dissolved.

J. A. Roy & Fils, lumber dealers, Montreal, Que., are stated to have assigned.

Limoges & Freres, lumber dealers, Terrebonne, Que., are stated to have dissolved.

Hodge & Walley, lumber manufacturers, Sherbrooke, Que., Geo. N. Hodge, deceased.

MacQuarrie & McLeod, builders, Winnipeg, Man., have been succeeded by MacQuarrie Bros.

It is reported that J. C. Tully, wholesale paper, twine, etc., Ottawa, Ont., has sold out to the National Bag & Paper Company, Limited.

The town of Kincardine, Ont., has recently completed a fine post office building at a cost of $25,000. It is three storeys high, of pressed brick with stone trimmings, 40 x 50 feet, and the interior fittings are of the very best. Mr. W. Nicholson, of Wingham, was the architect.

[illegible] ited, with a capital of $150,000, and head [illegible] Murray, F. H. Martin, Moose Jaw; P. J. Deardorf, S. McColl and C. P. Fullerton, Willipeg. The company will carry on [illegible]

Combinations of Brick and Concrete

There are some very interesting studies in some of the departures of architecture one witnesses these days, some that heretofore have been classified in these pages as vagrant tendencies. One specific instance that was illustrated and described at some length during the year was that of erecting brick buildings and facing them with a plaster made of cement and crushed tile. This, together with the trimmings, made a sort of mission effect that was rather ugly looking in the process of construction, but somewhat refreshing when completed. There are to be seen quite a number of examples of this kind, of brick walls, both new and old, being plastered over with cement preparations of one kind and another.

Then, there is another tendency that might be put in the same class; to use cement or concrete for the body of the structure and do the facing with brick and terra cotta. In some instances, in quite a number we might say, the concrete takes the place of steel construction and of the old brick walls. That is, instead of having a steel frame the framing and girders are made of reinforced concrete. In fact, the general structure is made of concrete and small bars of steel, instead of heavy steel beams, simply covered over and protected. Then the building is faced with brick, sometimes with one kind and sometimes with another; sometimes it embodies the use of quite a lot of terra-cotta. Again, we find stone trimmings quite conspicuous with the brick face and reinforced concrete body.

One of the first points about this that will interest the average brick man is just what effect the general tendency to use reinforced concrete in this way may have on the brick business. There are many instances where concrete practically replaces the steel, and the amount of brick and terra cotta used is substantially the same as in erecting steel buildings, with the exception of the hollow block fireproofing on the inside.

It is not so hard on the facing brick industry, where concrete is used in lieu of steel, but it does curtail some of the use of hollow block fireproofing on the inside.

It is not so hard on the facing brick industry, where concrete is used in lieu of steel, but it does curtail some of the use of hollow blocks for fireproofing. Therefore, we might argue that the injury, or rather the supplanting, has to do more with steel than with brick, and not bother anything more about it as a competitor so long as brick is used in facing. Sometimes, however, the walls that are built of concrete might otherwise be built of brick, and then we have concrete taking the place of common building bricks, which furnishes plenty of room for argument on the matter of cost. It is quite a common practice with the advocates of concrete to take facing bricks, or at least some of the higher grade bricks used in facing work, as a basis for figures in making the comparative cost of concrete construction with brick. So, where concrete replaces merely the common brick, and the fillers and the finer brick are still used for facing, there is quite a difference. The common brick is the cheap item in brickwork, consequently the saving in cost should be on the other side if the figuring is done right—should be in favor of brick instead of concrete on such structures as it is thought advisable to erect with solid walls in lieu of steel frames.—Clayworker.

A reinforced concrete beam, 24-inch wide, 7 feet deep, and of 26 feet $2\frac{1}{2}$-inch span, centre to centre of supporting columns, was used in the Jacobs Building, Montreal, to support a column carrying a load of 445,000 pounds at a distance of $9\frac{1}{2}$ feet from one of the supports. There is, in addition, a load of 46,400 pounds uniformly distributed over the span. The reinforcement consists of five 2 x $3\frac{1}{2}$-inch Kahn trussed bars placed in the lower element after the usual fashion of tension reinforcement. Ten 1-inch cup bars are placed in three layers between this tension reinforcement and the top of the beam, all these bars being bent up to take the shear. Additional reinforcement of trussed bars was placed at the end of the beam in the top, bending down into the columns.

British Trade Union Figures

Figures respecting the work of British trade unions in 1908 appeared recently in the Board of Trade Labor Gazette. Trade unions, registered and unregistered, numbered 1,165, with a membership of 2,378,248, a decrease of 1.4 per cent. on 1907, but an increase of 12.3 per cent. compared with 1906. For the eighth year in succession the membership of the building trade unions declined. Unions of general laborers declined by 14,000.

A tar macadam road, 30 feet wide and 400 feet long, was put down as an experiment at Kankakee, Ill., to discover whether this form of highway construction will reduce the dust nuisance caused by the wearing away of the top dressing of the shale macadam streets which are used to a great extent in that section. The dust from the limestone was washed into the sewers and formed a sediment which was removable with great difficulty. The street resurfaced had been paved with stone macadam three years before. Ordinary coal gas tar direct from the local works was used, after being allowed to settle for about a month in a large well, heated by a steam coil. It was applied to the road from 10-gallon hand sprinklers, the only method available; upon the hot tar was spread a top covering of crushed limestone, which was compacted by a 20-ton roller. After a period of three days the street was opened to traffic.

The crop of road contracts is said to be plentiful, but the engineers are skimping the specifications so as to get more road for the money, says "Rock Products." That makes a thin film of metal, so a great many of them cannot be called "good roads" by any means. There is no way to cut out the rock base without injuring the quality of the road. Opinions will always differ probably as to the top dressing or finish and its disposal, but there is no doubt about the experience with reference to the base of the road—it must be a compact mass of crushed rock of the three-inch size or larger, and deep enough, according to the character of the soil, to make a firm porous bed that will drain water promptly from the surface layers and pass it into the soil below or to side ditches through the soil. No road having less than a foot of such foundation can properly be designated a "good road."

In accordance with an Act passed at the last session of the Manitoba Legislature a number of architects have been appointed as a Board of Examiners for the province. The members are Messrs. Wm. Fingland, J. H. G. Russell, H. Matthews, W. Percy Over, and Prof. E. Brydon-Jack. In future no one will be able to practise the profession in Manitoba without passing the examination set by this Board.

In a recent communication to this journal, Building Inspector Jarrett, of Vancouver, says: "This city is now in a class by itself. There is every indication that she will be able to maintain the pace for some time."

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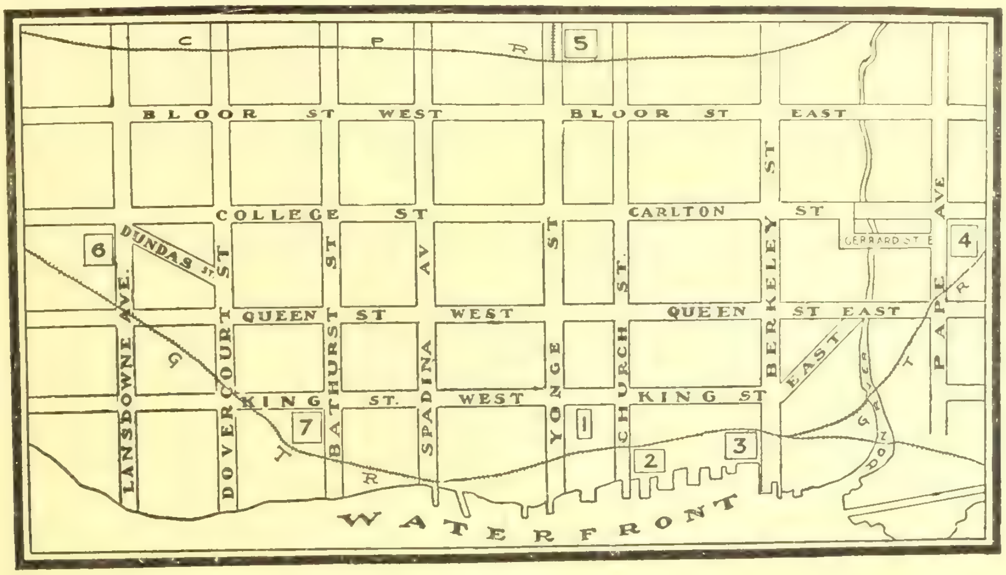

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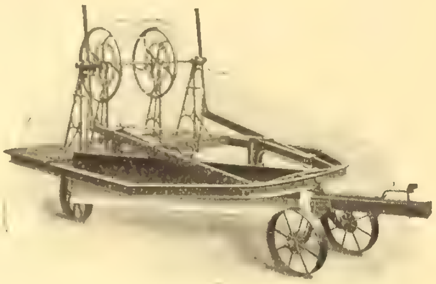

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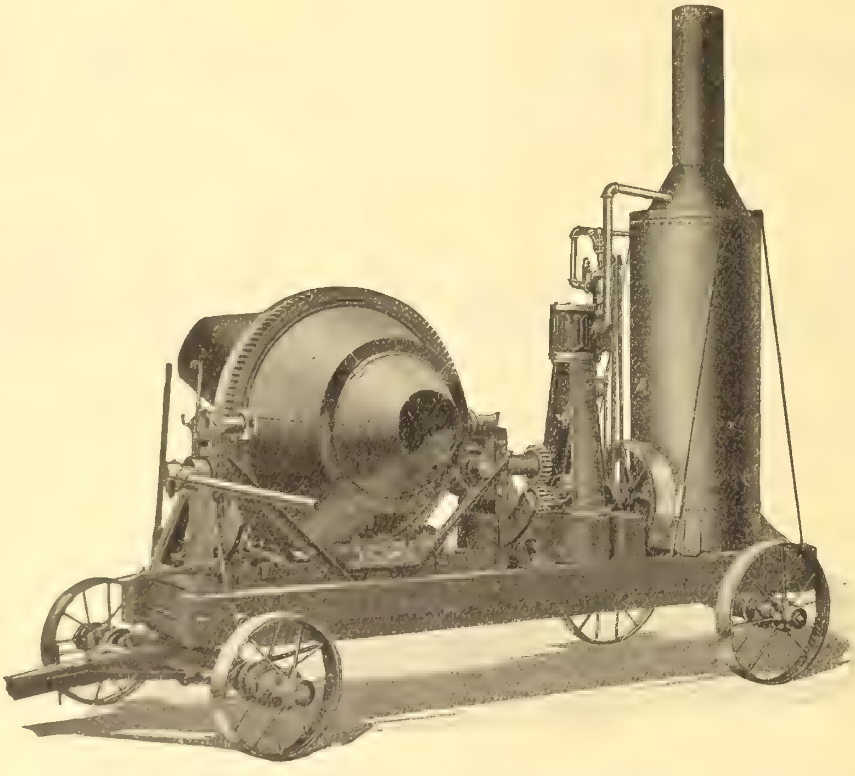

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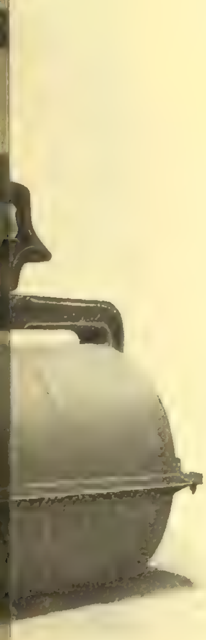

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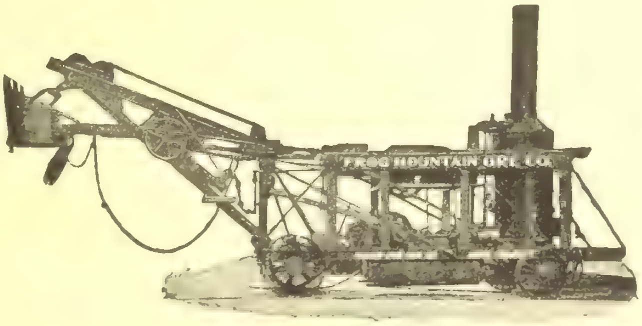

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Ozone Purification

Whether or no the report on the ozone purification plant at Lindsay, Ont., issued by the Provincial Board of Health of Ontario, constitutes the alpha and the omega of the Howard-Bridge system in Canada, it is certain that we are destined to hear considerably more about ozone purification. Ozone, generated electrically, has been occupying the attention of leading engineers and sanitarians for some time. It has been the subject of discussion at engineering gatherings; municipal authorities have been getting as much information about it as is available; technical publications have been giving it prominence, and during the past year, we are informed, the cities of Paris, St. Petersburg and Madrid, in Europe, and Ann Arbor, Mich., as well as a suburban company of Baltimore, Md., have adopted it for the purification of their supplies. In view of this we venture to think that the article contributed to this issue by Mr. Bridge, the inventor of the Howard-Bridge system, will be of the greatest interest at this time. The publication of the other information relating to the commercial utilization of ozone may also serve a useful purpose. The article is in no sense contributed as an apology or defence of the Howard-Bridge system, but purely and simply to explain certain theoretical parts of the system with which everybody, apparently, is not altogether familiar.

Importance of the Good Roads Movement

It is of interest to note that instruction in the science of road making is being added to the courses of some of the agricultural colleges in the United States. This is a step in the right direction, and one which should expand until every agricultural college, not only in the States but also in Canada, shall have such a department.

Good roads affect all concerned. The contractor who waits impatiently for material to be delivered may often lay a portion of the delay to the bad roads which hamper the material at some stage of its production, either at the beginning of its journey, or at the end. All parts of the country are culpable in the matter of roads, and reformation along this line can be preached in Canada with every assurance of its not being misdirected.

The interests of the "Contract Record" are common with those of municipalities and others concerned with good roads problems. It is our intention to devote increased attention to this field, and we shall be glad to have the practical co-operation of all connected therewith.

A New Record for Canadian Trade

The aggregate trade of Canada for the twelve months ended March 31, 1910, exceeded that of any previous twelve months' period.

For the twelve months ended March 31, 1910, the trade of Canada in merchandise was $668,530,064, showing a betterment over the same period in 1908, which was the record year in the history of Canadian trade expansion of $53,336,088, a gain of about 8.7 per cent., but when compared with the figures for the same period in 1909, the betterment was $120,472,348, a gain of about 22 per cent.

A further analysis of these figures will show that for the twelve months ended March 31, 1910, the imports of merchandise for consumption into Canada were valued at $369,766,071, showing an increase over the same period in 1908, of $17,941,047, a gain of about 5.1 per cent., but in comparison with the same period in 1909, it will be seen that the increase was $81,630,721, a gain of about 28.3 per cent.

The exports of merchandise from Canada during the same period in 1910, were $298,763,993, showing an increase over the same period in 1908, of $35,395,041, a gain of about 13.4 per cent., but the increase over the same period in 1909 was $38,841,627, a gain of about 15 per cent.

An analysis of the export figures of Canadian merchandise will show that the exports of the products of the farm during the same period in 1910, were valued at $144,360,262, or 51.7 per cent. of the total exports from Canada, while the exports of the mine, the fisheries, the forest and of manufactured goods were valued at $134,726,114, or $9,634,148 less than the value of farm products exported.

Architects' Strong Argument

President F. S. Baker, of the Royal Architectural Institute of Canada, has written to the Hon. J. O. Reaume, Minister of Public Works for Ontario, commenting upon the general conditions for the guidance of architects in preparing competitive designs for a new residence for the Lieutenant-Governor of Ontario. On behalf of the Institute, Mr. Baker maintains that no self-respecting architect could conform to the conditions, inasmuch as they provide that a board of professional assessors be appointed to select the designs. Further, the conditions do not guarantee to the author of the winning design the commission of carrying out the work at the regular recognized scale. Nor in face of the printed conditions can the Institute understand the object of the Department in advertising for competitive plans in such a case. If the Government were to ask an individual architect to prepare preliminary plans for a mansion to cost $225,000, the ordinary commission for such preliminary drawings without further work, would be $2,500. And the Government is apparently asking for this work to be done at a cost of $1,000!

Mr. Baker also pointed out in his letter that the architects from Halifax to Vancouver are at present protesting to the Federal Government for the unfairness of applying this same principle to the erection of Federal buildings at Ottawa, in which recent competition architects had naturally expected that the winning architect would be commissioned to carry out the work.

In conclusion the writer pointed out that if architects were not given both Provincial and Federal Government support, where could they possibly expect to receive it and what would the future appearance of the country be?

Methods of Road Building in Nova Scotia

Sub-Drainage for Wet and Frozen Lands—Road Machine Work Difficulties Encountered in Repair of Large Iron Bridges

By Hiram Donkin, C.E., Halifax.

Stony Roads—At one time the stony roads were thought to be the most difficult to build and maintain, but experience shows that while a greater expenditure may be necessary in the beginning, more lasting results can be obtained than with clay roads, and pains are taken to impress upon the inspectors and foremen that the principal consideration in building a stony road is to get the water off; this is a difficult matter where the ledge comes close to the surface. The next operation is to remove or break up all objectionable boulders. Even if nothing more than this can be done in one year, it prepares the roadbed properly for any repairs that may be afterwards added.

Clay Roads—Clay roads are found to be the most easily set up; and except where there are swamps or low places, they can be built up and graded by machinery—in proper hands. The discouraging part of the working with clay roads, is, that while they give the smoothest and most even surface during the dry season, if nothing further is done they are cut up by the heavy traffic as soon as the continued wet weather sets in and left in a worse condition than if they had never been set up. Many efforts have been made in gravelling clay roads, but gravel has been wasted for want of rolling and packing our foundations, as clay loosely set up will not stand the traffic. Few parts of the province, even through the richest farming districts, are not yet in a position to build really durable roads, and economic necessity demands that they shall be of earth or other available material for some years to come, and advantage should be taken of the material within reach, such as brush, common straw, swamp grass, tan bark, sand, sawdust, or wooden fibre of any kind, but none of these mixtures is of any value, unless the material is thoroughly rolled as it is put in place.

It is found that a clay road, set up either by hand or machinery, or by means of material hauled on by carts and left unrolled, cuts up badly the firse year, especially in a wet season, but if dressed up a second season, it will, under ordinary traffic, become as firm as the old bed of the same material. Even if the surface is gravelled over, a roadbed of this nature will cut up badly unless it is thoroughly rolled while the clay is being applied, or, if it is dressed with the road drag after the rainy season it will to some extent answer the same purpose, as if it were rolled in the beginning of the season. This, of course, involves additional expense. A clay road, no matter how well built, will not carry a lumber traffic—as a rule, lumbermen with their teams are engaged hauling the logs to their mills during the winter months and when the roads break up in the spring they immediately begin to haul the lumber to market, before the frost is really out of the ground or the spring rains over. They use narrow tired wagons and carry heavy loads of from two to three tons, and these will cut our best clay roads into lakes of mud in less than one week of continuous hauling. I know of a number of roads that were set up in good condition and carried the farmers' loads successfully with ordinary repairs, but which, after two weeks' hauling with lumber teams, were so badly rutted that they had to be abandoned, the lumbermen not only depriving themselves of two or three months' good hauling during the dry season, but the roads were rendered impassible for the farmers. I am of the opinion that it would pay the lumber companies and relieve the general public of a large amount of road expenditure if they could defer hauling until the wet season of the early spring is over. A greater part of the difficulty would thus be overcome and it would be the means of saving thousands of dollars for the province.

Sub-drainage for Wet and Frozen Lands—Miles of the roads are located on low, level lands and on springy soils, and for many weeks in the year are wet and well nigh impassable. Such roads may be greatly benefitted by sub-drainage. When wet weather sets in or where perennial springs exist in the soil under the road, they should be tapped by blind drains of stone, brick, or clay pipe, leading diagonally to the side ditches. Where side-hill roads are springy, deep open ditches on the higher sides will often suffice, otherwise sub-drainage must be resorted to.

The building and maintenance of the telegraph and telephone lines assist to some extent in cutting out the bushes on each side of the road. With the bushes cut the roads are less subject to damage, and they dry out more quickly when exposed to the sun and wind. These companies, however, cause considerable damage to the roads, owing to the fact that their posts are sometimes set too near the roadway and in a few cases they have actually been set up in the ditches. There is also some carelessness shown in cutting the bushes, and I have noticed one place where the C.P.R. telegraph posts were set up and the bushes and branches either thrown over into the ditches or left on the high side of the road and allowed to blow over.

Recommendations as to Road Machinery

Road Machine Work—From the reports received from the inspectors, it is found that there are about 132 road graders in the province, many of which are damaged and great delay is caused in keeping them in repair, as the parts of the machines are so weak that they are liable to break in operation. At least one grader, one road plough, and one roller are required in each polling district of the province. A trial was made to assist the surveyors of highway labor by providing them with a machine, and, in necessary cases providing an operator, but when two or three wished to use the machine at the same time as much assistance as desired could not be given. During last winter all the road machines available and not too badly out of repair were repaired, and they have been used to a greater extent than in the past. The Government purchased 11 new machines last year, yet as all the work had to be done about the same time, quite a number of the districts could not be supplied from the fact that there were not enough machines to do the work of the whole province. As labor is not now so easily procured as formerly and the price of same has advanced, it must be conceded that the upkeep of our roads must be worked out by means of road machinery. Already there have been imported one-half dozen four-horse ploughs, which are of great assistance in cleaning out many of the ditches that cannot be reached by means of the road grader. Cases came under my observation where pebbly, boulder roads with broad grass in the ditches could not be cleaned out by means of the grader and had to be left until these road ploughs were procured. With these four-horse ploughs the ditches that could not be reached the previous year were opened up. Although great benefits have resulted from the use of the road grader, a number of roads have been practically destroyed by a careless operation of the machine. There is a growing tendency to simply cut down the berms and pile this material in the centre of the road. On a 12-foot or 14-foot road, care should be taken to widen out the ditches, instead of narrowing the roadbed by cutting out the berms. If a 12-foot or 14-foot roadbed is narrowed to 8 feet or 10 feet and piled up in the centre with sod and rough material like a compost heap, and gravel hauled on, it makes the ditches deep and dangerous; two teams cannot pass in safety and the roadbed is partly destroyed, as the water is drawn to the centre of the road instead of from it. There is no necessity for cutting very deep ditches and throwing up a great mound in the centre. The roads should not be crowned more than enough to draw off the water. In a thoroughly packed roadbed, from one-half to three-quarters of an inch of crown per foot of width is sufficient, and in an unpacked roadbed from one-inch to one and one-half inches. In one or two cases ditches were cut four feet deep and the roadbed so highly crowned that tile piping had to be set in the bottom of the ditch and the ditch filled in to ordinary depth. The road grader is very useful in cleaning out a mucky ditch, but there is no sense in piling up a lot of poor material on a soft foundation. It would be better left alone, for then there would not be such a depth of mud to travel through.

Nova Scotia Makes Steady Progress

Improvements Made—Gravelling has been successfully carried on in a number of sections this year, but I regret to say that the greater portion of our road work is patching, and although patching is not desirable, a large sum of money must yet be expended in such repairs, in order to make the roads passably good. On several roads near the southern shore, where the foundations are largely made up of buolders irregularly set in and projecting above the surface, it has been the custom to haul on material to cover them over. Last year the principal expenditure was in blasting these boulders and this year these roads were set up with the grader and plough and the method of removing objectionable rocks from all our largely travelled roads, before adding more material to the roads, is being carried out. Although the matter of drainage has been fairly well attended to, as much was not done as desirable, owing to lack of funds. It took 100 years to build all the roads of the province, and it cannot be expected, owing to the condition they were in when the Roads Office took them in hand, to do much more than make a gradual improvement. A number of miles of a better class of road than ordinary have been built and every year the mileage of improved roads will increase, so that after some years the great expenditure on repairs will be reduced to a minimum. The advance in making these more lasting roads must be slow, although good progress has been made so far. All the post roads of the province are at least 40 per cent. better than they were when taken over by the Roads Office two years ago, and up to the first of August even the worst clay roads were in fair condition.

Renewal of Bridges

In renewing the bridges which had been carried out by freshets, I communicated instructions to the inspectors that all these structures should be renewed in a greater span and height. These instructions are being followed out, except in cases where, after freshets, the superstructure carried out is floated back and replaced. It seems to have been the custom for years, as wood became scarce, to narrow up and confine the streams in smaller vents. If it is a fact that the clearing up of the country is the cause of the water running of suddenly in case of heavy downfalls, our bridges must be enlarged to carry the increased streams, and this has been my experience of the past 20 years.

Several diversions of roads around steep hills have been made this year—among others, the Lodge Hill, Lunenburg County, which had been a source of annoyance ever since the road was built some 70 or 80 years ago. It rose to a height of 150 feet, on a grade from 1 in 6 to 1 in 12, and as the ledge rock came to the surface, the side hill was flooded by water from springs during the winter. As the hill sloped abruptly to the sea, a number of serious accidents have occurred. Back drains were cleaned out and by filling in a hollow and diverting the line for 300 feet or 400 feet, the grade was reduced to 1 in 14. The road over Blockhouse Hill, in the same county, over a short steep hill, was carried around practically level. Several surveys have been made in other parts of the province for diversions of a similar nature, but these are not yet completed.

As has already been remarked, it is a question whether it is profitable to roll clay or gravel which has been put on to fill in a new road, or repair an old one in the early spring or summer, when one season's travel and redressing will accomplish the same results, as the additional cost of rolling is at least one-third. I think when good material is used on a road it should be thoroughly rolled. Several short pieces of road have been rolled this year wherever a horse roller could be obtained.

Methods of Improvement

A section of road in Falmouth, from Lewis Armstrong's to D. A. Railway crossing, was put in good shape. This road had been in bad condition, and last spring was practically impassable. On the south side of the road a 4-inch tile was placed four feet below the surface and well packed with straw and about one foot of ordinary field stone put on top, covered with earth. Over this surface drains were cut on either side of the road with the road machine and the road built up, leaving shoulders of about 15 inches. Inside these shoulders a strip of 12 feet in width was thoroughly packed with stone to a depth of one foot, and rolled in layers and a heavy layer of gravel put on top and rolled in with a 5-ton roller. Several springs of water were found in the centre of the road, which is occupied for the [illegible]. Tile pipes were laid in these places, leading into the sub-drains on the sides. This is now looked upon as a piece of road that will last for some time, in a section where there is a large amount of heavy travel. Several other places throughout the province have been repaired in the same manner, but were not rolled.

Two portable crushers were last year made over to this department—one in the county of Queens, which is in good repair, and one in the county of Halifax. The latter crusher was operated on the road from Dartmouth town to the Nova Scotia Hospital. The work was performed in accordance with the directions given in the Bulletin on Broken Stone Roads. The officer expending the highway labor in connection with the sugar refinery and vicinity, wished to continue the broken stone road beyond their works, on the road toward Cow Bay, and agreed to pay for all labor in connection with the work and also to subscribe a certain sum, on condition that the Government would expend a like sum in providing and crushing the material. This agreement was made and carried out and the work is still in progress. The work done last year shows good results. The road stood well the frosts of last winter and was as dry and firm in the spring as when first rolled.

The Main Post Road leading from Dartmouth to Musquodoboit, carrying all the travel of Lower Musquodoboit and the eastern shore to Guysboro, has been put in good repair, but in several places for the first ten miles out from Dartmouth, the material at hand is of such a poor quality that it is not durable, and as there are large quantities of stone on each side of the road, I would recommend that a portable crusher and roller combined, of the latest improved design, be purchased, and crushed stone be put on the places above mentioned. A mile of good road near a large town is subjected to more wear than a number of miles of similar road in thinly settled districts, as there are 100 travellers in the former case to one in the latter. If metal roads can be afforded, these are first to be attended to. Road makers acquainted with the heavy travel leading to our principal coal mines, will all agree that the roads in these sections cannot be kept up with the clay material to be had from the coal formation, and if only one-half mile of metal surfaced roads could be built each year in such districts, even if the metal was carried from a distance and cost more than material near at hand, I believe it would be the means of saving money.

Painting Iron Bridges

I had all the badly corroded bridges attended to, but was compelled to leave about one-half those that simply required painting. I had difficulty in procuring foremen painters who could properly attend to the cleaning of the steel and to the mixing and application of the paint. This is a very important matter, as a coat of paint carelessly applied will not stop corrosion. I had also some difficulty in supplying the foremen with paint. Some of them preferred Sherwin & Williams' mixed paints, as they were accustomed to using them; others wished to use graphite and tar paints, as they were more easily applied. The first lot was purchased from Messrs. Sherwin & Williams, and was a mixed red lead. A few barrels of tar and graphite paint were also purchased, so that work could be started without delay. On July 8th tenders were asked for unmixed red lead and oil, and a number of samples were submitted, which samples were opened and examined by an assayist. Those submitted by Messrs. Melvin & Company, of this city; D. G. Kirk, of Antigonish, and by Messrs. Brandham-Henderson Company, of this city, proved to be of the same quality, and were probably of the same manufacture, and the prices ranged about the same. If there were any choice, it would be for that submitted by Messrs. Melvin & Company. Prices were asked by letter for mixed paints of the same quality, and Messrs. Melvin & Company quoted the lowest, and the balance of the paint required was purchased from them. I painted iron bars with each of the samples received, and have them exposed to the weather. Many of them show rust right through. We have four samples of red lead, three of black paint, and one of grey, which so far show no signs of rust. I have found that to clean and apply one coat of paint to a 100-foot span averages a cost of $50, and the average quantity of red lead required for such is about 11 gallons, and I think it is poor economy to apply a cheap paint when for a few cents additional in price it is possible to procure the best paint on the market.

Factories and their Fire Protection

The enormous aggregate of the American fire waste, which contrasts so unfavorably with European prudence, is beginning to cripple and impoverish us as the natural resources of the country, once believed to be inexhaustible, are ceasing to respond to the demands of our habitual extravagance, says the "Architectural Record." The common notion that the insurance companies pay the cost of the fires is gradually giving way to an intelligent understanding of the fact that they are merely the collectors and distributors of the fire tax. They must recover from the public the sums they pay out in losses, plus the cost of conducting their business and a reasonable interest upon their capital. Fire protection engineering is coming to be a profession by itself, but, after all, its chief distinguishing quality is common sense.

Experience in fire protection engineering suggests three points to be kept in mind in planning a factory: There should be as little combustible material as possible used in its construction and equipment. Each floor should be absolutely cut off from every other floor, and each section from every other section, so that fire may not communicate. Every part of the factory should be equipped with extinguishing apparatus. It is obvious that a factory of reinforced concrete will present certain advantages respecting the fire hazard over the slow-burning or "mill-construction" type; although the latter is preferred by many manufacturers as presenting more convenient surfaces for the attachment of pulleys, shafting and machinery. Slow-burning construction is not undesirable if properly safeguarded and protected. The advantages of the use of reinforced concrete appear when we consider that with such construction every floor may by avoidance of vertical openings through it, be made practically a fire wall. The floors being incombustible, a fire in any storey may generally be confined to it.

Inspection and Repairing of Wooden Bridges

The following directions for the inspection and repairing of wooden bridges are taken from a bulletin recently issued by the Bureau of Town Highways of the New York Department of Highways for the guidance of county and town superintendents:

The timbers of wooden bridges should be inspected by boring with a $\frac{3}{4}$-inch auger into the main members. This boring should be done in such a way that rain water cannot enter the hole; i.e., the hole should enter the timber from the under side. The holes should afterward be plugged with wood. The iron hangers should be equally strained. This condition can be determined by striking adjacent rods with a piece of hard wood or iron and noting the tone or pitch. The rod having the lower tone can be tightened until the pitch is the same as that of the rod having the higher tone. In case a nut is rusted fast and cannot be moved by a wrench, it can be very readily loosened by heating it quickly with a gasoline torch. Care should be exercised to avoid heating the rod, as the idea is to expand the nut and thus loosen it.

If a wooden bridge is in such good condition that it will probably not be renewed for some years, the covering (roof or weather boarding) should be very carefully watched, as a heavy wooden bridge might last for years if properly covered, while a small leak in the roof, if neglected, might be the cause of the bridge decaying in a few seasons. Splices and keys in the bottom chord should be watched to see that there is no crushing of the wood back of the splice bolts.

The floor beams should be large enough to get a bearing over the entire width of the bottom chord and the planking should be laid with openings to clear the deck of water and dirt. The planking in all cases should be spiked to the floor joist to prevent undue vibration and noise. The mud sills and corbels should be renewed as fast as decay becomes apparent. There should be an apron of wood or stone between the bridge deck and the roadway dirt. This apron should be renewed from time to time as the necessity becomes apparent.

If the trusses become weak they should be made safe in the following manner: There should be placed on the ground under the bridge or in the bed of the stream a mud sill of wood about 10 inches square and about 3 feet longer than the width of the bridge. A corresponding cap of like dimensions should be attached under the bridge and in contact with the trusses at a panel point. Two vertical pieces about 8 by 8 or 10 by 10 and a little longer than the distance between the mud sill and cap, should be provided and should be placed by blocking the upper ends under the cap piece and then driving the lower ends until they are perfectly rigid. The lower ends should be retained by blocks spiked to the mud sills. These trestle bents should always be put up in pairs at an equal number of panel points from each end.

Dull Finish for Rough Plastered Walls

A contractor who had several rooms in a school building to paint where the walls were rough plastered and the finish was to be a dull one, wrote to the "Painters' Magazine" to know what size to use on the walls and how to mix the paint in order to obtain the result desired. The journal in question replied as follows.

For cheap work, size the walls with a wall or suction varnish, then apply one coat of oil paint, a mixture of equal parts pure lead and pure zinc in oil, thinned with three parts raw linseed oil and one part turpentine and dryer in equal portions. Have this mixture tinted with oil colors, same as the finish desired.

For the finish use zinc white ground in oil, tinted to suit, and thin with one part raw oil and three parts turpentine with sufficient japan dryer. Have this paint stout and stipple it, as in this way you will have the best, most uniform effect.

Another method is to thin down pure white lead in oil with raw oil, not over ten pounds lead to one gallon of oil, adding a trifle japan, applying this direct to the plaster. When dry, apply a coat of glue size prepared as follows: One pound good white glue dissolved in one-half gallon of boiling water, one pound good bar soap dissolved in one quart boiling water, and two pounds of alum dissolved in one quart of boiling water. Add these solutions, while still warm, together, stirring in the meantime. The alum water should be added last, and slowly. When all is smooth add enough cold water to make it of the consistency of heavy varnish.

Apply the size with a large wall brush, and, if it does not work free enough, warm it some. Follow this with two coats of paint, as described above for the first method.

Creed and Contract Matters

Ottawa, June 1, 1910.

Editor, "Contract Record":

Referring to your article, "Should Creed Enter into Contract Matters?" published in your issue of May 18, your comments are timely and to the point. The Ottawa Exchange, fortunately, was not compelled to act, as the School Board, at another meeting, rescinded the previous motion and awarded the contract to the company comprised of one public school and one separate school supporter. The various Builders' Exchanges throughout Canada are opposed to such discrimination as was at first threatened. They stand for the awarding of contracts in a broad-minded, equitable manner, without reference to creed or denomination.

Thanking you for your attitude in this matter,

Yours very truly,
D. J. MacKenzie,
Secretary, Ottawa Builders' Exchange.

The city of Winnipeg is experimenting with a new kind of paving material which is said to be better than macadam and cheaper than asphalt. This is a layer of small stone mixed with bitumen placed directly on a macadam base, without any intermediate concrete base. This pavefent is said to be $1.25 cheaper than asphalt. It is to be used on residential streets where there is a fair amount of traffic. A special mixing machine will have to be purchased at a cost of $8,000.

The Dominion Government is taking steps to compel contractors to pay the wages stipulated in their contracts, and also to enforce the payment of damages for injuries. The Minister of Labor lays down his policy in the following terms:

"Where contractors in such cases remain indifferent to the just claims of their employees injured on public works, the Government would be justified in using its influence to secure a settlement of outstanding claims, failing which contractors should be given to understand that their future tenders will not receive consideration."

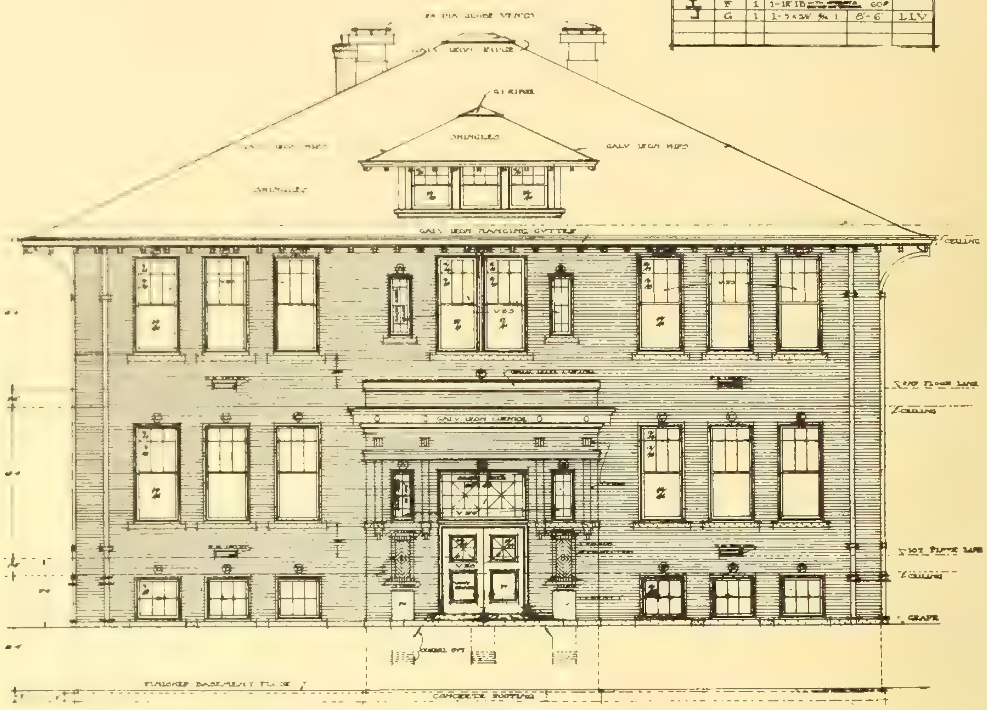
Those at the read of railway enterprises in British Columbia regard the present scarcity of labor in that province as a grave crisis. It is said that the C.P.R. and C.N.R. programmes of work are being considerably cut down for this reason, and that the G.T.P. is finding the greatest difficulty in securing men for the Prince Rupert section. The only remedy, apparently, is to introduce Chinese on a large scale, but this plan the labor unions strenuously oppose.

A Builders' Exchange has been organized at Regina, Sask. The following officers have been elected for the ensuing year: President, R. J. Leckie, of Messrs. Peter Lyall & Sons; Vice-president, Gordon [illegible], of the Saskatchewan Construction Company; Treasurer, W. Martin; Directors, D. Smith, H. Potts, T. [illegible] and J. M. Taylor.

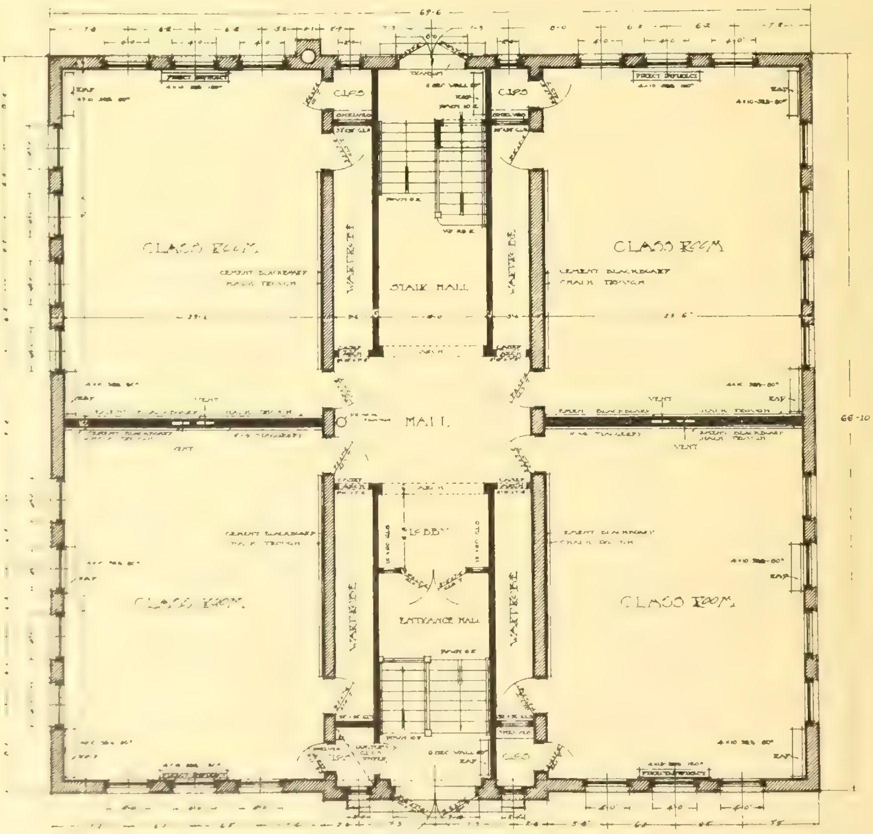
In a recent communication, Mr. J. W. McCurdy, city clerk of Fredericton, N.B., informs us that there is great activity in all the building trades at Fredericton. There is a scarcity of both mechanics and laborers and wages are correspondingly high in consequence.

Design for 8-Room School at Amherstburg, Ont.

LIST OF LINTELS & IB'S					
SECTION	MARKED	NO. REQ.	DESCRIPTION	LENGTH	REMARK
	A	14	1 3½×3-⅝ L	2'-8"	SLV
	B	2	1-5×3½-⅝ L	7'-2"	LLV
	C	44	1-3½×3-⅝ L	4'-8"	SLV
	C	32	[illegible]	4'-8"	SLV
	D	12	1-3½×5-⅝ L	4'-8"	SLV
	D	16	[illegible]	4'-8	SLV
	E	1	1-5×3½-⅝ L	8'-6"	LLV
	F	1	1-12" IB [illegible] 60#		
	G	1	1-5×3½-⅝ L	8'-6"	LLV



Front Elevation.



First Floor Plan.

Plans for 8-Room School Building

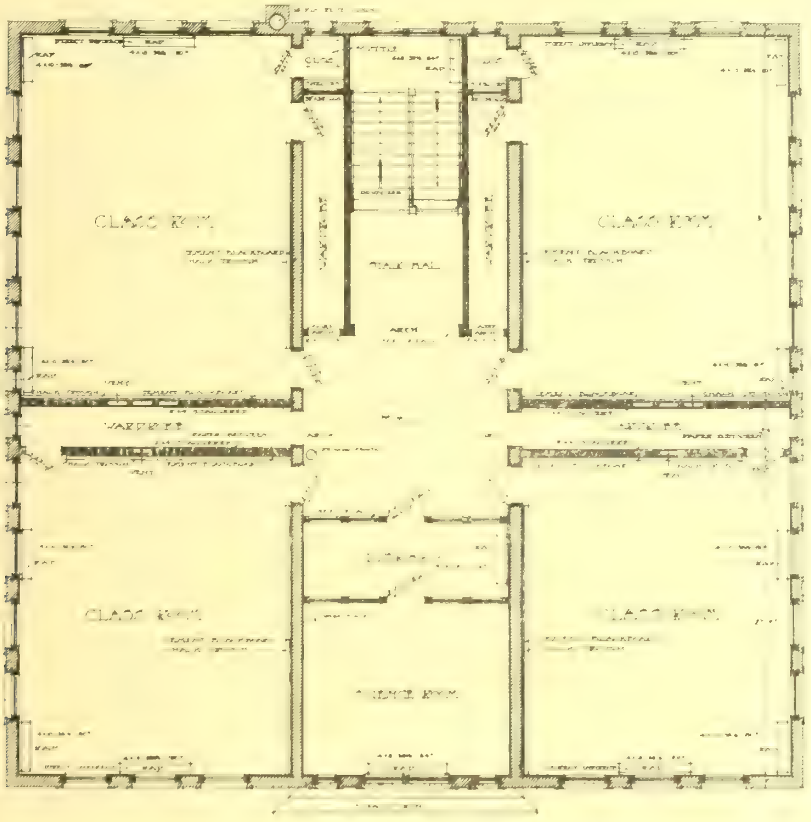
The plans reproduced on these pages are those for an 8-room school at Amherstburg, Ont.

The building, from the grade course up, is constructed of brick with stone trimmings. The basement walls are of stone with concrete footings and tile drains inside and out. The roof is covered with XXX British Columbia shingles.

The basement provides for boiler and fuel room, and separate play rooms, lunch rooms and toilets for both sexes.

Maple is being used for the first and second floors and Georgia pine for inside finish.

The school is heated by steam, the Pease heating and ventilating system being used. Modern plumbing fixtures are installed, these including Ideal automatic closets and Standard lavatories in toilet rooms. Drinking fountains are provided in halls on first and second floors. Water is connected to the science room.



First Floor Plan.—Amherstburg School

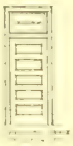
This school, which is 66 feet 10 inches x 69 feet 6 inches complete, including grading, is costing $16,500. Watt, Jacques & Williamson, Boug Building, Windsor, Ont., and 216 Masonic Temple, London, Ont., are the architects.

According to Mr. Chas. W. Eliot, president of Harvard University, labor unions, by reason of the manner in which they supplant individualism and regulate output, undoubtedly degrade human character.

Ottawa contractors, like their confreres at Montreal, are fairly inundated with work. The activity in the Federal capital this year is stated to be greater than ever before. The G.T.R. buildings, views of which were shown in our issue of February 9th, are going up with remarkable rapidity, while the Hope and Rosenthal buildings are nearly completed. There are dozens of residences and smaller business buildings of all kinds under way. An important work in prospect is the addition to the departmental buildings, for which tenders will be called in July.

Construction of Concrete Walls

The first thing to consider in the building of a walk is the character of the soil to be covered. Sometimes when the soil is heavy and holds water, a sub-base or foundation of gravel or cinders is necessary to prevent heaving from frost, but when the soil has good natural drainage, the sub-base may be omitted. In building a walk, if a sub-base or foundation is required, dig a trench six inches wider than the proposed walk and to a depth which will permit of 8 inches of gravel or cinders beneath the walk. The gravel or cinders should be packed well by wetting thoroughly and tamping. Forms in which to build the walk must be provided and should be built of lumber two inches thick. One-inch stuff is sometimes used, but will require more stakes and the line of the walk will not be as good, for it is impossible to keep light material in good alignment. Only two-inch stuff should be selected if new lumber has to be purchased for use as forms. Generally speaking, the width of the material for forms should equal the thickness of the walk. For instance, 2 x 4-inch stuff would be used for a 4-inch walk, and 2 x 5-inch stuff for a 5-inch walk. The thickness of a walk may be varied somewhat from the width of the lumber used for forms by raising or lowering the forms above or below the surface of the ground upon which they would otherwise rest.



The thickness of the standard walk is 4¾ inches, therefore lumber 2 x 5 inches surfaced, will make a form which will be about right. Lumber 2 x 6 inches, surfaced, will usually be easiest to obtain and can be used very nicely.

Wherever a curved line is wanted in the walk, ¼-inch stuff or strips of sheet metal the width desired should be provided, as such material can be bent easily and held in the proper position by stakes. If the walk is to look well when completed care must be taken to place and keep the forms straight and even and they also should be carefully levelled. If the walk is being built on an incline, have the grade uniform. The walk should be made a little higher on one side than on the other, for the purpose of providing drainage; a ¼-inch to the foot of width will be ample, and this may easily be accomplished by having the forms on one side a little higher than on the other. The side forms should be held in place by stakes set about three feet apart on the outside with an occasional temporary stake on the inside to hold them in an upright position. A cross form which consists of a piece the length of which is the same as the width of the walk, is placed between the side forms at the point where the joint in the finished walk is to occur, and is held in place by two stakes on the outside of the form. When the concrete is being placed, push a little against the inside of the cross form

The Ozone System of Water Purification

An Explanation of its Theory and Operation, with Special Reference to the Lindsay Plant — The Commercial Utilization of Ozone

By J. Howard Bridge

In a sentence, the ozone purification of water consists of very rough filtration followed by aeration—aeration by electrified atmospheric air.

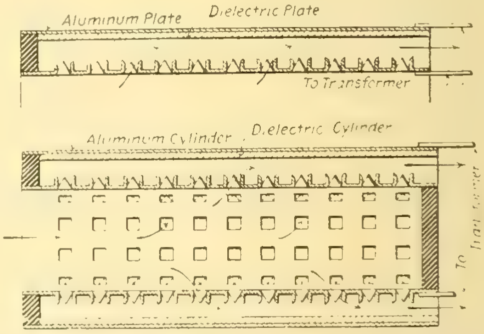
The filtration practised is of the crudest sort. It is just open enough to remove the grosser particles of suspended matter, and it aims at no biological effect. The theory of it is simply to remove the mud, and leave the bacteria for the ozone to destroy. It is thus possible to run these scrubbers at a rate never attempted in any simple filtration system. At Baltimore, for instance, a five million gallon pre-filter is only 20 feet by 20 feet; so that its rate of operation is 500 times as rapid as that of slow sand filters. At Ann Arbor, the filter is 30 feet square, and is capable of passing four and a half million gallons a day. These filters are cleaned by simply reversing the current, under a pressure of 40 to 60 pounds, and the operation occupies less than five minutes. A few hundred dollars will build such a filter, and its cost of operation is simply the cost of pumping and purifying the water used for washing.

In the Howard-Bridge system of ozone purification, which is the only one in use on this continent for the treatment of municipal supplies, the ozonized air is brought into contact with the water to be purified, by the flow of the water itself. The law of gravitation, which needs no lubricant, never gets out of order and calls for no skilled attendance, does most of the work. The water under treatment falls down a series of earthenware pipes embedded in the concrete lining of a well, and in doing so sucks in the air needed for its purification. The mixture of air and water is projected by its own weight into the bottom of the well, and then it passes across a series of baffles designed to keep the air from passing too rapidly from the water. At Lindsay, the sterilizing well has a capacity of 5,000 gallons; so that when the pumps are working at 1,000 gallons a minute, which is their normal rate, the ozone is kept in contact with the water for five minutes. As the air rises faster than the water, it follows that every particle of water is repeatedly brought into contact with fresh bubbles of ozone. The result is that the water comes out of the well thoroughly aerated, bright and sparkling, and free from the objectionable color, taste and smell of the swampy streams from which the supply is taken. The official test of the plant, upon which its acceptance by the town was based, showed a reduction of bacteria from 1,500 per c.c. to 12, with complete elimination of all noxious organisms and, as has been said with the removal of swampy color, taste and smell.

The way in which this result is accomplished is very simple. Ozone is simply a very active form of oxygen. When it comes into contact with any oxidizable matter, the latter is transformed into a gas, which passes off into the air. There is therefore no residuum left to filter out. Bacteria are like all organic bodies: they consist mainly of water—about 84 per cent. Of the solids remaining, more than half are carbon, and this carbon combines chemically with the ozone to form CO_2, carbonic acid gas, which is inert in water. In like manner the dissolved matter, which gives the swamp water its vegetable stain, is oxidized into gaseous or other innocuous forms. Nitrites, for instance, become nitrates, which mark the last and stable form into which organic bodies undergoing dissolution pass in nature. And, of course, nitrates, unlike nitrites, are a sign that the purification process is complete.

Ozone is formed by passing atmospheric air into a space across which an electric brush discharge is passing. It is not known for certain how this is accomplished. The latest theory is that the negative ions or corpuscles present in the air-space are projected by the electric discharge across this air-space with inconceivable rapidity, and, coming into violent collision with the oxygen molecules, break them up. The atoms forming these molecules then re-combine, some in clusters of three, some in clusters of two. It is the three-atom molecule which is ozone. In physics ordinary oxygen is written O_2; ozone, its allotropic form, is O_3. Much new light is being thrown on these mysterious transformations by discoveries in radio-activity; and with knowledge of the causation of ozone will come increasing ability to produce it cheaply.

However scientifically interesting ozonization may be, and however efficient it may prove in water purification, the conclusive test of its commerciability is its cost. And this, after many years of experiment and improvement, seems to have been finally determined in favor of the new process. At Lindsay, for example, the entire cost of operation is less than 50 cents per million gallons, which is only about one-tenth that of slow sand filtration. In first cost, too, the new process appears to have the advantage over older methods of water purification. At Lindsay, the ozone plant, including pre-filters, cost the town $8,200. At Lawrence, Mass., a slow filter of like capacity, cost $53,000 to build. At Ann Arbor the cost of the plant, including filter, was somewhere about $5,000 a million gallons daily capacity. Slow sand filters average $25,000 to $35,000 per million. Allowing for possible favorable conditions of construction and operation at the two places mentioned, it looks as if ozonization has now reached a development that puts it, as far as concerns the cost of construction and operation, into very active competition with either slow sand or mechanical filtration.



The Plate and Tubular Ozone Generators of the Bridge System

Commercial Utilization of Ozone

Concerning the commercial utilization of ozone for water purification, the "Engineering News" has this to say:

There is now no question as to how ozone acts and no doubt as to its great efficacy as a destroyer of bacteria and organic matter contained in water. This objectionable organic matter is literally burned up—converted to carbon dioxide Ozone is frequently called a "sterilizing" agent. Its use can be carried to such an extreme that it will actually

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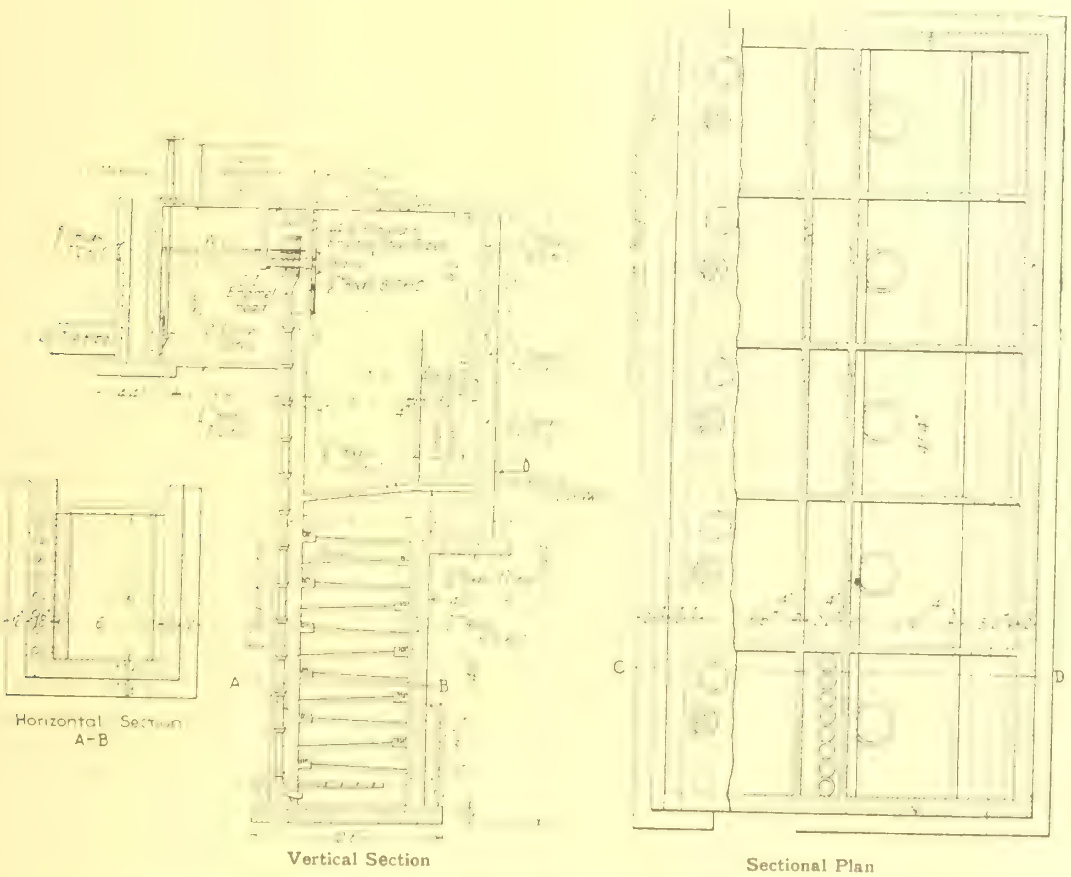
*A description of the Lindsay plant was published in our issue of May 26th, 1909 sterilize as effectively as any other process, but, in plants for purifying city water supplies, however, it is unnecessary and uneconomical to carry the treatment so far. As ozone, or ozonized air rather, is but very slightly soluble in water and as the bacteria and organic matter are thoroughly disseminated, the ozone works under a great handicap in its attack. Anything that contributes to the intimate mixture of the water and the ozone promotes that attack; but it is obviously difficult, at least with our present knowledge, to secure and keep this intimate mixture of liquid and gas. The wonder is that ozone can be as efficacious as it is.

Experiments Demonstrate Efficacy

The oxidizing power of ozone seems to be particularly effective against pathogenic bacteria. As an illustration of the activity of ozone, it may be interesting to quote a few figures secured recently in American laboratory investigations. By spraying a water containing 100,000 to 300,000 colon bacilli per cu. cm. into an atmosphere of ozone, having a concentration of 2.5 grams per cu. m., the bacteria count was reduced to 1 per 5 cu. cm. With a river water, containing from 1,000 to 3,000 bacteria per cu. cm., treated under similar conditions and in the same apparatus, a concentration of 6 grams per cu. m. of air was needed for the absolute destruction of B. coli, but with 2.25 grame concentration, only 1 B. coli was left per 5 cu. cm. However, while only 1 colon bacillus was noted in 5 cu. cm., 150 bacteria were counted per cu. cm., but they were shown to be spore-bearing types. Even with as high a concentration as 6.5 grams of ozone per cu. m. of air, 40 of these spore-bearers were left in each centimeter.

In another series of experiments on a highly contaminated water, approximately 1 per cent. sewage, a singe treatment with ozone having a concentration of 12 grams per cu. m., and with a consumption of 1.25 grams of ozone per cu. m. of water treated, reduced the bacteria count from 60,000 to 400. A second treatment with ozone at a concentration of 10 and a consumption of 0.77 grams more cu. m. of water, reduced the count to 40, with the probable removal of all B. coli. The bactericidal efficiency of the first treatment was then 99.333 per cent., and of the two treatments 99.933 per cent. A sample of settled sewage was similarly experimented upon with ozonized air in saturation bottles at a concentration of 12 grams. The first treatment reduced the bacterial count from 12,000,000 to 15,000, with a consumption of 9 grams per cu. m. of water. A second treatment, in which 5 grams per cu. m. additional was absorbed, reduced the count to 750. A third treatment with an absorption of 3 grams per cu. m. of water, reduced it to 200 cu. m., and a fourth treatment with an absorption of only 1 gram cu. m. brought the count down to 40. The total consumption of 18 grams in four treatments, then, brought the count from 12,000,000 to 40.



Vertical Section

Sectional Plan

Arrangement of Sterilizing Wells, Bridge process as installed at Lindsay, Ont.

These figures are very interesting as showing what can be done by an imperfect mechanical mixture of ozone and water, but they do not throw the least light, of course, on the commercial practicability of such sterilizing processes.

Misapprehension as to Treatment

There is much misapprehension of what the [illegible] ozone treatment of water really is and what it has to recommend it over other processes. We believe that one of the elements of greatest value to its exploitation is its inherent characteristic appeal to the public. It must be admitted that there is something very attractive to the public mind in the proposition to pass bubbles of ozonized or "electrified" air through a contaminated water. On the other hand, the public is more or less suspicious of the addition of chemicals to water, and there are always plenty to aver that the water so treated has a queer taste. Even with a filtered water supply the public is apt to be suspicious of holes in the filters, even though long practical experience with both mechanical and slow sand filtration has shown that such fears and suspicions are practically groundless.

A second element of great value in the ozone process lies in the ease and quickness of removing color (stain as distinguished from turbidity), taste and odor in cases where filtration and chemical disinfection can do this imperfectly or at great expense. It is well, however, to recognize from the start that ozone is effective in disposing of organic matter only, having practically no effect on other impurities except metallic salts.

It has been claimed by promoters of ozone processes that removal of screening of the coarsest suspended matter, followed by ozone contact will be cheaper than any other process of water treatment. It remains to be demonstrated, however, just where preliminary treatment plus ozone contact will be more economical than sedimentation or coagulation and filtration.

It should be remembered in this connection that, with any filtration of suspended matter which is more than a mere screening, a reduction of the number of bacteria in the water always takes place. Therefore, when something more than screening is needed to remove finely divided objectionable matter, previous to ozone treatment, the other contamination would be removed during that process (extended, perhaps) and the ozone contact would seem more or less superfluous.

Possibilities and Limitations Not Yet Determined

For determining whether or not an ozone water-purification system is desirable in a given location, no general rules can be made—even laying aside public prejudices for or against any system. There can hardly be a clear definition of either the possibilities or the limitations of ozone processes until many complete series of studies have been made by independent engineers of repute.

The average costs of the several kinds of water-purification plants would be highly interesting if obtainable. In the present state of the art, however, only the most general comparisons can be made. By examination of the records of a few plants it appears probable that where a plant for treating a clear but contaminated water with ozone has cost $3,000 per million gallons capacity, a slow-sand filter would cost something like $20,000 for the same capacity, a mechanical filter would cost some $10,000, and a plant for dosing with hypochlorite of lime would cost only about $120.

A plant for rough filtration followed by ozone treatment has cost about $5,500 per million gallons capacity. From recent installations it is probable that if hypochlorite dosing were substituted for the ozone treatment the plant would have cost about $2,700 for the same capacity. But this figure is yet to be determined by the operation of commercial plants on a large scale. Theoretically, of course, there is a great advantage in operating a filter at a very high rate and relying on an ozone treatment to dispose of such bacteria as are carried through the filter. Practically the additional complication of a double treatment system is a serious handicap to any such system.

Cases for Which Ozone Seems Best Adapted

So far as can be seen at present, the ozone treatment is best suited for waters which are already satisfactory as regards color, taste, odor, etc., but are dangerous because of sewage contamination. There are many water supplies taken from the lakes or the St. Lawrence to which this description allies. There are also some underground supplies and supplies from large storage reservoirs which need no treatment except the destruction of possible pathogenic bacteria.

Of course, no hard and fast rules can be laid down as to what ozone is or is not adapted, until the commercial position of the ozone process is better established. The situation in this respect resembles that which many engineers will recall in the early days of mechanical filtration. The likeness is further carried out in the existence of at least five competing companies exploiting different processes of ozone treatment.

At the present rather unsettled stage of development of ozone water-treating systems, it is not safe to say that the apparatus will take care of itself, like the alternating current transformer, for instance. On the other hand, an ozone plant should be as reliable, successful and economical in operation as any other water-treating system if well installed under competent advice and if well cared for and maintained. The ozone generators are hardly to be classed as delicate machinery, although they seem to be put out of service with greater or less ease. The auxiliary machinery—pumps, coolers, etc.—can be made as reliable for use here as anywhere. Of course, if continuity and reliability of operations is to be assured, there must be a skilled mechanic in charge and a supply of duplicate parts, as with any other system involving the use of fine machinery.

The processes and apparatus for making and using ozone are still far from fixed. Too many avenues are open for progress to permit great rigidity in design or operating method. Were all the useful patents brought under a single control and were all the ozone-generator designs made available for a competent designer to select the best features from each, an ozone generator of high economy would result. Were all the methods for forcing contact of ozone and water similarly combined, we might get a system with which this could be done, with a slight loss of head. Each successive inventor has devised one or more good features about which he has built up his system. Such a consolidation as is suggested above has taken place in many other mechanical fields, and a similar result may eventually be reached here.

Mr. Bridge Replies to the Provincial Board of Health

While the above article has been in type a report has been issued by the Provincial Board of Health of Ontario, demonstrating with much detail that the Lindsay plant is a failure, owing to the fact that the ozone is not brought into efficient contact with the water. The inventor of the system has replied to this report as follows:

With much travail, a mountain has again been delivered of a mouse.

After seven months the Provincial Board of Health of Ontario has brought forth a report on the Lindsay ozone plant. And its twenty odd printed pages and dozen photographs, diagrams and tablets may be summarized in one sentence and explained in another:

1. The ozonizers produce more ozone than is necessary to purify the water; but

2. Owing to the low level of the water in the river—necessitated by the rebuilding of the dam and locks below—there was, at the time of the tests, not enough fall to suck this ozone into intimate contact with the water.

To quote from the report (page 14), "there was sufficient ozone produced, therefore, assuming 500,000 gallons (equivalent to 2,272 cubic metres) as the maximum capacity of the Lindsay plant, to yield 1.08 grams of ozone for every cubic metre of water to be pumped. At Paderborn, where the water is very pure chemically, 1.3 grams of ozone per cubic metre of water are used, while at St. Maur, Paris, the amount is only .658 grams of ozone per cubic metre."

In other words, the Lindsay plant produces nearly twice as much ozone per unit of water as is successfully used in Paris, and, it may be added, nearly four times as much as at Breda, Holland.

But—and here is the explanation of everything found faulty by the Provincial Board of Health—"the ozone which was being generated was not being drawn into the water. The greater the head of water, of course, the greater the efficiency of any aspirator. The greatest possible head in the well at Lindsay is 3 feet, which is the difference between the surface of the water over the aspirators and the surface of the water in the sterilizing water well." (Page 13.)

In other words, the river was abnormally low; a head of 3 feet was not fall enough for the water to pull the ozone down the sterilizing well.

These tests were conducted in secret, by the appointees of an official who had condemned the plant even before it was completed. They had never seen an ozone plant before, and we read in the report that one of them "was nearly ozonized into another sphere" while opening a pipe which ought not to have been tampered with only under expert guidance. Had the investigation been intended to be fair and impartial there would have been no need of secrecy nor of the hostility with which my first suggestion concerning the tests were received. As I pointed out at the time, in a protest to the Provincial Board of Health, this secrecy would vitiate and make valueless the report; and but for this secrecy a remedy for all the failures which it took three months to tabulate could have been applied in two days.

As already quoted, the report states that during these tests "the greatest possible head in the (sterilizing) well is 3 feet." Normally it is nearly double this; which means that the part of the plant was reduced almost four-fold in action and probably forty-fold in efficiency. The entire question of the efficacy of the system is dependent upon this matter of available working head; but a larger blower could have been installed in two days, so as to overcome this temporary defect. The defect was made apparent to the investigators by their very first tests; and had I been allowed to see the results of these tests, I should have indicated the remedy, and the succeeding weeks and months of purposeless accumulation of error would have been saved by the simple expedient of increasing the strength of the blower.

Unreliability of Report.

To indicate the unreliability of the report, a single technical example can be taken from page 12, where it is stated that the concentration of ozone with the aspirators and blower working was only .275; but when a plug was removed so the blower could readily drive the air out of the pipe, the concentration was nearly three times as great, viz., .66. This is an absurdity. If more air passed through the ozonizers because of the removal of the plug, the concentration of ozone in that air would necessarily be lower than it would be when less air was passed through the ozonizers. This would seem to be a self-evident fact; but it is one which the inexperienced laboratory experts were incompetent to recognize. There are numerous other errors of fact and judgment, due to the inexperience of the men who at Lindsay there saw on ozone plant for the first time in their lives.

When Dr. Archibald tested the plant and found it efficient, the available working head was greater than it was during the Provincial Board's investigation; and this alone, without investigation, is sufficient to explain the difference in results obtained. The unfriendly animus of the report just issued is traceable on almost every page; but nowhere is it so salient as in the offensive suggestions on page 17, that "there must have been some other (than mechanical) reason for the difference in the results," and that the "problem might well be worth investigation by the Water Commissioners of Lindsay." The "difference in results" is due to difference in conditions—chiefly water level in the river, and the changes in apparatus necessitated by it. The report states (page 17) that "the mechanism for mixing the ozone and water and the sand filters were exactly the same then as now." This is not so. The aspirators had all been replaced by others of a different shape. Further, the valves which automatically regulated the supply of water to the sterilizers had been removed, the intention being to replace them when the new locks and dam are finished and the river allowed to rise to its normal level. The attitude of secrecy, suspicion and hostility adopted by the Provincial Board's representatives—under instructions, no doubt, from Toronto—was inevitably bound to lead to errors and misjudgments; but it is surprising that they should lead to covert charges like that quoted. This offensive innuendo is a gratuitous insult to the gentleman employed by Lindsay to make the test, which the Provincial Board itself at that time refused to make—a gentleman whose character and standing as a conscientious and skilful bacteriologist are too well known in Ontario to need defending here.

On December 9, 1909, I wrote to the Provincial Board of Health, to protest against the manner in which the investigation was being conducted, giving reasons therefor, and I demanded in the name of common fairness to be allowed to witness the tests. This reasonable request was refused, and I notified the Board that I should hold their report as of no value. This was half a year before it was published, and I find no justification in its pages for reversing my attitude concerning it. I have knowledge that nearly every citizen of Lindsay shares my distrust of this series of tests; and the increased use of the public water supply and the improved health of the town's people since the installation of the ozone plant are emphatic endorsements of the correctness of the popular belief that Lindsay's water is now wholesome, thoroughly sanitary and as agreeable to the palate as it had previously been offensive.

As I intimated in my protest of December, I shall return to Lindsay, and, with the town's consent, institute a fresh series of tests, in which there will be no secrecy and no semi-asphyxiation of inexperienced operators.

J. HOWARD BRIDGE.

Philadelphia, Pa., June 1, 1910.

C. P. R. Extensions in the Northwest

According to an official programme of the Canadian Pacific Railway, 621 miles of new road are under construction this year, according to the following summary:

A large portion will be "colonization" lines—extensions of existing branches in recently settled sections. It is estimated that 346 miles of new road will be built in Saskatchewan, 45 in Alberta, 174 in British Columbia, and 56 in Manitoba. The new construction in Manitoba will include double-tracking the line from Winnipeg to Portage la Prairie (and eventually to Brandon), which will give a double track 518 miles from Portage la Prairie to Fort William, a section which has often been congested during grain movements.

The city of Guelph is laying a tar macadam roadway on Norfolk street by the flushing method, which has proved very successful in the past.

Dr. C. A. Hodgetts, Toronto, has been awarded a fellowship in the Royal Sanitary Institute of London, Eng., in recognition of his work for the Provincial Board of Health.

In a recent movement for good roads in Buckeye county, Arizona, one of the speakers made the following statement: "The relation of public roads to education has been largely overlooked. The long continued condition of the roads of a community reflect the degree of intelligence and enterprise of its people; the fertility of the soil and nearly every other matter pertaining to an agricultural district may be judged from the condition of the roads."

The town council of Berlin, Ont., are at present paving their principal thoroughfare, King street. They are also double tracking the street railway, which is a municipal-owned enterprise, using for the purpose 76-pound rails, laid on oak ties, with 6 inches of concrete underneath ties. The track allowance is paved with vitrified brick, bithulithic driveways at sides and concrete gutters. The Warren Bituminous Paving Company are the contractors.

The appointment by the Dominion Government of a Royal Commission on Industrial Training and Technical Education should be very gratifying to the building trades. The personnel of the commission is particularly strong and practical results are sure to be forthcoming. The Minister of Labor states that the commission will start work early in July by touring the Dominion, from the Atlantic to the Pacific, with a view to ascertaining the needs of employers and employees as regards industrial training. Afterwards, a thorough investigation will be made of the conditions that obtain in the United States and Europe.

A surface finish for concrete, whereby a sand coating is applied, may be secured by the following method, outlined by Mr. Albert Moyer, of the Vulcanite Portland Cement Company. Erect forms of rough boards in courses of three feet or less and plaster the insides with wet clay, worked to a plastic consistency. While the clay is wet apply evenly loose buff, red or other colored sand, and then pour in the concrete. After removing the forms, wash off the clay with water and, if necessary, scrub lightly with a brush. The sand, Mr. Moyer states, will adhere to the concrete and give a surface of pleasing color and texture.

Toronto's Investigation of Subway Question

The information on the subway question gathered at New York by the Toronto delegation, may be stated briefly. New York built 25 miles of double track subway for $50,000,000. This included all stations, ballasting, and rails. The equipment cost $25,000,000. Upon this investment the traffic has paid from the beginning. The city found the money for the work. It was carried out by the operating company, who afterwards leased the road for 50 years. They pay a rental of 3⅛ per cent. of the cost, which represents the city's liability, and one per cent. additional to provide a sinking fund which will retire the bonds in 43 years. The company has a right to a renewal of agreement for a second period of 25 years. It is found that the average haul on the subways is five miles. The longest distance for five cents is 17 miles. The cost of carrying a passenger is 2⅓ cents. In greater New York, covering 6,600,000 population, the number of car rides per inhabitant is just as many as in Toronto, where, on a basis of 350,000 population, the 98,000,000 passengers carried by the Toronto Railway Company last year figure out exactly at 280 rides per head.

A City Plan Commission

In the recent conference on city planning held at Rochester, N.Y., Mr. Frederick L. Ford, city engineer of Hartford, Conn., described the duties and performances of the Hartford commission, known as the Commission on City Planning, which has existed in that city for about three years. This commission consists of the mayor, the president of the board of street commissioners, the president of the board of park commissioners, superintendent of public parks, city engineer, one member of the board of aldermen and one of the common council and two citizens not holding any office under the city government; the last two serving two years, the term of one ending each year. The representatives of the aldermen and common council each serve for one year. This commission considers and reports upon "all questions concerning the location of any public building, esplanade, boulevard, parkway, street, highway, square or park," which must be referred to it by the common council before final action is taken. Council may refer to the commission the construction or carrying out of any public work which is not expressly within the province of some other board or commission of the city. The commission may prepare maps of the city or any portion of it, showing locations proposed for any new street or other highway, park, building, etc., which it may have under consideration, and may employ expert advice in making the maps and plans. The commission has retained Messrs. Carrere and Hastings, of New York, as expert advisers in planning future developments of the city.

Under the direction of this commission the Department of Engineering is now preparing topographical maps of the outlying sections of the city, preparatory to the laying out of streets over all undeveloped areas. The city intends to prepare a street plan for every undeveloped acre within the city limits, even where there may be no prospect of any development for two or three decades to come. The object will be to have the street plan in these harmonize with the existing streets, both as to alignment and width, these also being adjusted to anticipate so far as possible the uses to which the streets will be subjected. Like most cities, Hartford has suffered from the unwise division of areas in accordance with private aims at maximum profits rather than maximum public convenience. To avoid this an ordinance has been passed providing that "No street plotted or opened by any private person, firm or corporation shall hereafter be accepted by the court of common council until the petition for same, with plot or plan showing proposed location of such street or highway and its width, shall have been referred to and approved by the Commission on City Plan."

One of the most interesting sections of the charter amendment creating this commission is the one providing that the city "acting through said commission, or otherwise, shall have power to appropriate, enter upon and hold in fee real estate within its corporate limits for establishing esplanades, boulevards, parkways, park grounds, streets, highways, squares, sites for public buildings, and reservations in and about and along and leading to any or all of the same; and, after the establishment, layout and completion of such improvements, may convey any real estate thus acquired and not necessary for such improvements, with or without reservations concerning the future use and occupation of such real estate so as to protect such public works and improvements and their environs, and to preserve the view, appearance, light, air and usefulness of such public works."

Annual Conventions

June 6-8—Canadian Electrical Association, at the Royal Muskoka Hotel, Muskoka, Ont. (Secretary, T. S. Young, Toronto.)

June 21-24—American Society of Civil Engineers, at Chicago. (Secretary, C. W. Hunt, New York City.)

August 24-27—Royal Architectural Institute of Canada, at Winnipeg, Man. (Secretary, Alcide Chausse, Montreal.)

June 28-July 2—American Society for Testing Materials, at Atlantic City, N.J. (Secretary, E. Marburg, Philadelphia, Pa.)

Fire-Resisting Paints for Interior Woodwork

In discussing the question as to what sort of a paint is best adapted for use upon interior woodwork in order to render it as fire-resisting as possible, the "Painters' Magazine" presents the following: Experience has shown that paints consisting mainly of linseed oil, driers and pigment are not fire-resisting, let alone fireproof. However, repeated coatings of water glass (silicate of soda) will serve the purpose. Apply to the wood three coats of silicate of soda 33 deg. Beaume, and before the last coat has set hard, apply a thin lime wash, which unites with the silicate of soda, forming silicate of lime, which is an insoluble substance.

Another fire-resisting paint is made as follows: Eighty pounds powdered silex, 40 pounds bolted china clay, and 20 pounds air-slacked lime are mixed intimately with 60 pounds liquid silicate of soda, 33 deg. Beaume, and then thinned to painting consistency. It may be colored with any earth color, such as ochre, umber, sienna or red oxide, but not with chemical colors. Two coats are necessary. If the paint is to be pure white, add in place of any color sufficient dry zinc white, using additional silicate of soda in the first mixing.

The disastrous effect of delay in finishing work on the part of a contractor was shown recently. The case was one in which the contractor undertook to lay concrete foundation for pavement, to be completed by September 22. The work was not completed until sometime later, however, running the work into the winter, when some of the concrete froze and was rejected as defective. The court did not hold the city liable for payment of this work, even though the city inspectors were on the job and allowed the concrete to be put in.

The Eastern Canadian Steel & Iron Works, Limited, will shortly start operations at Quebec, Que. The company has secured a large tract of land at St. Malo on the line of the C.P.R., and is about to commence the erection of worksheds and other buildings. The president of the concern is Mr. Rodolphe Forget, M.P., and the secretary-treasurer, Mr. J. T. Donohue, Montreal.

To Estimate Brickwork

Some practical hints apropos of the above subject are given by the "American Carpenter and Builder" in response to a query received from a correspondent, who writes:

"I would like to know how many bricks per lineal foot (or foot measure) it will take for a 9-inch wall, 13-inch wall, 18-inch wall, 22 and 26-inch wall, using 8½-inch and 9-inch bricks; also the width of the different footings. In superficial measure I have been allowing 7½ bricks for each 4 inches of wall (width of one brick), but have been told that 6 bricks is plenty, using 9-inch brick (or 8¾). Of course, I allow 5 per cent. for breakage, etc."

Answer: There is scarcely any other material used in building about which so many ideas and customs of measuring and estimating prevail as in brickwork, and it is very difficult, if not impossible, to give a rule to fit all localities. The writer has before him a list of nine leading standard makes of American bricks and one well known imported firebrick, and no two sizes are alike. Your rule of allowing 7½ bricks for each superficial foot of wall one brick (4 inches) in thickness is pretty general in all districts where the eastern standard brick is in use (about 8 or 8¼ by 4 by 2¼ inches). But the trouble is that no two brickmakers seem to turn out bricks exactly alike, and thus it may be that with bricks from certain kilns 6 bricks would be sufficient.

Another plan is to cube your walling and estimate 21 bricks per cubic foot, which is a fairly safe method for bricks of the size mentioned above. It is often usual, however, on large jobs of brickwork, for the builder to specify a minimum size for the bricks, so as to guard against losses from estimating that a certain number will build so much walling. Allowance must also be made for the size of joints, which may vary from ⅛-inch for pressed brick up to ½ or even ⅝-inch for common brick. A wall with ⅜-inch joints will take 12 or 15 per cent. less bricks than one with ⅛-inch joints.

The following table of the number of bricks per lineal foot for brick footings with offsets of 2 inches to each course, is in pretty general use, and is fairly reliable, although subject, of course, to the variations noted above, caused by bricks of different localities varying in size:

9-inch wall,	footing 2 courses,	10½
13-inch wall,	footing 3 courses,	22½
18-inch wall,	footing 4 courses,	39
22-inch wall,	footing 5 courses,	60
26-inch wall,	footing 6 courses,	85½

In Great Britain and some of her colonies which have formally adopted the British system of quantity surveying whereby the quantities of all materials are "taken off," "abstracted" and "billed" from the architect's drawings and specifications by clerks who make a specialty of this work, all brickwork is reduced to rods of 16½ feet by 16½ feet of 1½ bricks in thickness. With the standard English brick of 8¾ inches long by 2¾ inches thick, with ¼-inch joints, this gives 16 bricks for every superficial foot of "reduced brickwork," as it is termed, and forms an excellent basis for estimating prices.

A civil engineer of Vienna, Arthur Schymanski, has invented a novel street cleaning machine, which does not raise the dust and simplifies the work of keeping the streets clean. It consists of an automobile with a revolving brush which sweeps up the dust and throws it into a large funnel, from which it is sucked up by a ventilator and deposited in large metal boxes. The dust is neither left on the street to be collected later, nor can the wind distribute it. The boxes can be removed when full and can be replaced by empty ones. The wagon is driven by a 28-32 horse-power motor, and can sweep at the rate of 11 miles an hour. Simple contrivances permit the removal of the filled boxes and the insertion of the empty cans.

From the Federal Capital

The work of constructing the drainage system in the western section of the city will probably be held up for months through a legal technicality. The city engineer's department had just finished the plans and was preparing to start operations when the city solicitor advised that it would be necessary to secure a special Act of the Legislature fixing the assessment on the property benefited by the improvement, before the work could be proceeded with.

Gangs of men are now at work on most of the toll roads in the Ottawa district making extensive improvements. Many of those thoroughfares were condemned by the provincial authorities and the companies controlling them were ordered to improve them before collecting tolls again.

Members of the Board of Control propose that the minimum wage for corporation laborers should be 21 cents an hour instead of slightly over 19 cents an hour as heretofore. City Engineer Ker says that this will mean an increased expenditure on civic works of over $22,000 a year. The matter is still under consideration.

Cutting Prices—A Contractor's Soliloquy

(With Apologies to "Hamlet.")

To cut or not to cut. That is the question.
Whether it is not better in the end
To let the chap who knows not the worth
Have the business at cut-throat prices, or
To take up arms against his competition,
And by opposing cut for cut, end it.
To cut—and by cutting put the other cutter
Out of business—'tis a consummation
Devoutly to be wished. To cut—to slash
Perchance myself to get it in the neck—
Aye—there's the rub; for when one starts to meet
The other fellow's prices, 'tis like as not
He's up against it good and hard,
To cut and to slash is not to end the confusion
And the many evils the trade is pestered with:
Nay, nay, Pauline; 'tis but the forerunner
Of debt and mortgage such a course portends.
'Tis well to get the prices the goods are worth
And not be bluffed into selling them for what
So-and-so will sell his goods for.
Price cutting doth appear unseemly
And fit only for the man who knows not
What his goods are worth, and who, ere long,
By stress of making vain comparison
'Twixt bank account and liabilities,
Will make his exit from the business.—Anon.

Chimney Draught

In order to have a good draught, a chimney ought to satisfy the following conditions.

The section of the chimney ought not to be larger than is necessary to allow an exit for the products of combustion; otherwise ascending and descending currents are produced in the chimney, which cause it to smoke. It is advantageous to place on the top of the chimney a conical pot narrower than the chimney, so that the smoke may escape with sufficient velocity to resist the action of the wind.

The chimney ought to be sufficiently high; for, as the draught is caused by the excess of the external over the internal pressure, this excess is greater in proportion as the column of heated air is longer.

Carleton county, N.B., has formed a Good Roads Association, of which Mr. Jas. Carr is president, Mr. A. Plummer, vice-president, and Mr. Henry Phillips (Woodstock, N.B.), secretary.

LEGAL DEPARTMENT

[illegible] to this Department is requested from [illegible], Contractors and Builders. Send in [illegible] of recent cases in which you were interested [illegible] facts tersely.

Negligence of Municipal Corporations—In the action, Joncas v. City of Ottawa, the plaintiff sued to recover damages for injuries sustained by falling on a slippery sidewalk, the ice from which should have been removed by the defendants. No contributory negligence on the part of plaintiff could be found. Consequently it was held that he was entitled to recover [illegible] with costs.

Damages for Actions Threatened and Liens—Small v. Clarke; Court of Appeal. This was an appeal by defendants from a judgment awarded plaintiff of $8,750 to be paid by defendants as damages for breach of contract. Plaintiff brought action to recover $15,000 damages, alleged to have been caused plaintiff by reason of actions threatened and liens put upon his property in Hamilton, the Grand Opera House, which had been erected by defendants for him, at an agreed price of $25,000, and which liens plaintiff had to pay. At the first trial judgment was given for the plaintiff for $8,750 and costs, and the Divisional Court dismissed defendants' appeal therefrom. The Court of Appeal reversed these judgments and entered judgment for defendants for $950 on a counterclaim with costs throughout.

Recovery for Work Done Under Verbal Agreement—Campbell v. Community General Hospital; Divisional Court of Ontario. Plaintiffs drilled a well for water, on a farm owned by defendants. Defendants contended that plaintiffs agreed to find water in three or four days, or to get no other pay than board for men and fuel for engine. The jury found this was not a condition and that the agreement was as stated by plaintiffs. Plaintiffs claimed $308 for drilling and $6 for pipe supplied. It was held at the first trial that the contract was not valid and binding upon defendants, as it was beyond the scope of the authority of Sister Demers, the procurator-general, who had entered into the contract, and it not being in writing and under the corporate seal of defendants, the action should be dismissed, without costs. The Divisional court reversed this decision and entered judgment for plaintiffs for $308 and costs.

Liability for Cost of Plans—Chappell Bros. & Company, Limited, v. City of Sydney, N.S.; Supreme Court of Nova Scotia. The library committee appointed by the city proceeded without special authority to call for plans and specifications for a new library building, for the erection of which Mr. Carnegie had offered $15,000. Chappell Bros. submitted plans which were accepted, and according to which tenders were called. Chappell Bros., who are also building contractors, submitted a bid. The bid, however, was not accepted, or at least was not acted upon, as the building has not been erected. After this the library committee reported on the matter to the city council, which approved the transaction. The court held that the city was liable for a reasonable amount for the plans furnished on implied contract with the committee. The amount sued for was $426. Judgment was given for $250. (It is interesting to note that in an appeal brought subsequently by the city judgment was again given for Chappell Bros., the amount of whose recovery was fixed at the amount claimed originally, namely, $426.)

Injury to Workman; Damages—In the action, Christie v. Richardson, the defendant Richardson was the contractor for the carpentry work and the defendant, Webb, the contractor for the brick work on a schoolhouse which was being erected in the neighborhood of Toronto. The plaintiff was a bricklayer in the employment of the defendant Webb. Plaintiff claimed a breach of duty on the part of Webb in neglecting to provide a safe gangway for the men to pass to and from their work in the building; he also alleged the right to recover from Richardson on the ground of interference by the latter with the gangway which contributed to its unsafe condition. Plaintiff was walking up the gangway when the structure collapsed and he was precipitated into the basement sustaining severe injuries. This gangway was constructed of three planks, two of them laid side by side with a small space between them, and the third laid on the top of these two, with its centre over the space, and, as constructed, it was admittedly safe. On the day before the accident, the carpenters had occasion to take into the building some heavy mullions, and in order to enable them to do this it was necessary to widen the gangway, and that was done. The taking in of the mullions was completed shortly before five o'clock in the afternoon of the same day, and the addition that had been made to the gangway was left there when the workmen stopped work for the day, and the plaintiff made use of it in leaving when his day's work was done. The court held that there was nothing to indicate to the plaintiff that the addition was not intended to be used as part of the gangway, and it was the duty of Leitch (Webb's foreman) to see that it might be safely used in its altered state, which could have been readily ascertained by an inspection of it. If it had been inspected the accident would not have happened. That the accident was caused by his negligence in performance of the duty with which he was entrusted by the defendant, Webb, of seeing that the ways, etc., were proper: That the plaintiff was not guilty of contributory negligence, and that he was entitled to judgment against defendant Webb for $800, the damages assessed by the jury, with costs. The action against the defendant Richardson was dismissed, without costs.

Recovery for Work Done Under Instructions from Government Engineer—E. A. Wallberg v. the King; Dominion Exchequer Court. An appeal from previous action in which plaintiff was awarded $53,205.62. The action was instituted by Wallberg to recover payment for certain works in connection with the Intercolonial Railway at Moncton. He contracted with the Intercolonial Railway for the erection of buildings costing $1,000,000. In the preparation of plans for these buildings no provision was made for drainage or water connection. Mr. McKenzie, Chief Engineer of the Intercolonial Railway, who was entrusted by the Government with the supervision of the work, directed Wallberg to carry out the necessary works for water supply, undertaking that the Government should pay him the actual cost of the works and an additional sum of 15 per cent. contractor's profit. No written contract was made. On the completion of the works the contractor had to apply to the Government for payment. The Government agreed to pay him, but considered the amount claimed excessive and directed a reference to the Exchequer Court to ascertain the amount properly due. The trial was proceeded with and the plaintiff was allowed the sum of $53,205, without interest. The court held that the registrar had not adopted the correct method of dealing with the case. They had proceeded as if the market value of the work had to be ascertained and concluded that the works could have been carried out for less money if a different plan of construction had been adopted. This, however, was unfair to the contractor and the case must be viewed from the standpoint of how much the work was worth according to Mr. McKenzie's plans. Possible incompetency of the engineer could not be argued against the contractor. The court used the following argument: "Now, suppose I instruct a contractor to build me a house of ordinary size, say rentable at about $400 per annum. A brick wall of the thickness of 1½ bricks would be sufficient for all practicable purposes. There is no written contract. I have a whim that I would like a wall about three feet thick, and I tell the contractor to so build the house. The contractor follows my instructions and gets paid on a 'quantum meruit.' The extra thickness of wall would have little or no effect on the market price, but is not the contractor to be paid for the work?" Judgment was entered for the contractor for the full amount of the cost of the work plus 15 per cent. profit. He was also allowed the costs of the appeal.

Personal Mention

Mr. E. Gardiner, engineer of Grantham township, Ont., has resigned.

Mr. A. W. Ross, Brantford, Ont., has obtained a position as engineer with the Dominion Bridge Company, Montreal.

Mr. J. Hutcheon, city engineer of Guelph, left recently for the west, where for the next three months he will be engaged on Government survey work on Grand Hog river, west of Carhart.

Mr. C. H. Power, of Messrs. Chipman & Power, consulting engineers, Toronto, returned recently from an extended trip through western Canada, undertaken in the interests of his firm.

The report of the appointment of Mr. J. P. Forde as supervising engineer on the construction of the C. N. R. in British Columbia is contradicted. The post was still open at our last hearing.

Mr. R. E. W. Hagarty, Toronto, secretary of the Canadian Cement and Concrete Association, who recently returned from abroad, has become identified with the Trussed Concrete Steel Company, at Detroit, Mich.

Mr. Dosithe Chene has been appointed city engineer of Hull, Que., vice Mr. Farley, resigned. The salary is stated to be $125 a month. Mr. Chene, like Mr. Farley, is a native of Hull. He graduated quite recently from Laval University.

Mr. Thos. Catterall, of Victoria, B.C., well known in contracting circles in that city, has left Canada for a five months' trip to England and the Continent. Mr. Catterall has earned his holiday by 43 years of continuous work. He has not been in England for 40 years.

Mr. A. O. Powell, who was called in by the city of New Westminster, B.C., to settle a dispute between the city and Herman & Burwell, the engineers who supervised the Coquitlam pipe line, has recommended that the engineers be paid $4,660 for their services, about half the amount asked for by that firm.

Mr. V. W. Forneret has been appointed superintending engineer of the St. Lawrence ship canal, vice Mr. F. W. Cowie, who has succeeded to the post of chief engineer of the Montreal Harbor. Mr. Forneret was Mr. Cowie's assistant for many years. He graduated from McGill University in 1887, and is a member of the Canadian Society of Civil Engineers.

Mr. Thos. S. Scott, formerly assistant city engineer of Toronto, has been appointed president and general manager of the Bitulithic Pavement Company, of Vancouver. Some interesting tales are heard in connection with Mr. Scott. It is stated that while he was with the G.T.R. as foreman on construction work he changed 9½ miles of track in ten hours with one gang of men working in one direction. This is said to have created a record for North America and incidentally to have made a particular impression upon General Manager McGuigan.

Mr. A. P. Gillies, of the engineering firm of F. N. Andrews & Company, New York, was in Toronto last week making preliminary arrangements with a view to placing before the City Council a proposition to build a large terminal station. Mr. Gillies will ask the City Council for a franchise. The estimated cost of the work he proposes to carry out is $25,000,000.

Mr. F. A. Acland, Deputy Minister of Labor, left Ottawa last week for Regina, Sask., to investigate a strike of the building trades in that city, which affects some 400 men. At the time of Mr. Acland's departure the strike had been in progress for three weeks. One of the most important Government works tied up in consequence thereof are the new Parliament Buildings of Saskatchewan.

The resignation is announced of Mr. R. W. Farley, city engineer of Hull, Que., Mr. Farley is 49 years of age. He was first appointed to the city engineership of Hull in 1898. He resigned in 1902 to take up private practice. From this time until 1908 he devoted his attention to municipal engineering problems, making a specialty of waterworks and sewerage construction. He was again appointed city engineer in May, 1908. Mr. Farley is a member of the Canadian Society of Civil Engineers. He will continue to act as city engineer until his successor has become familiar with the work now in progress. It is understood that he contemplates returning to private practice, which he finds more remunerative.

Notes and Comments

The union carpenters at Fort William and Port Arthur, Ont., are endeavoring to obtain a new schedule.

Toronto's building permits for the first five months of 1910 totalled $7,518,098, an increase of $690,268 over the corresponding period of last year.

Building permits issued at Saskatoon, Sask., since the first of the year, totalled one and a half millions. The figures for the month of May were $856,000.

The Hunter Bridge & Boiler Company, of Kincardine, Ont., manufacturers of bridges, boilers, steel water towers and stand pipes, have recently completed a large addition to their plant. The new wing is 176 x 76 feet, of reinforced concrete and brick, which, with additions of new machinery, greatly increases the capacity of the factory.

The J. I. Case Threshing Machine Company, Inc., have favored us with a copy of an informative, well illustrated catalogue relating to the "Case" steam road roller. The strong claims made for this machine in the past are fortified by the evidence in proof contained in this booklet. The contents thereof will be worth the careful study of all who are interested in improved streets and highways.

The general feeling of the people of Lindsay, Ont., at the condemnation of their ozone plant by the Provincial Board of Health may be guaged from a recent dispatch containing the following extract: "The town will ignore absolutely the adverse report of the Provincial Board of Health. Furthermore, if the Board tries to close down the plant, the town will fight the attempt through all the courts in the land."

A petition was recently presented to the Dominion Parliament at Ottawa by the Stonecutters' Union of Vancouver and the Manitoba Union, asking for the better protection of the stonecutting industry. The memorial of the Manitoba stonecutters set forth that the duty on articles consumed by them had gone up 30 to 35 per cent., and the duty on cut stone was only 20 per cent., the result being that men were walking the streets out of employment while immense quantities of cut stone were being imported from the United States.

Canadian City Engineers

Joachim Antonisen, Port Arthur, Ont.

Christiana, the capital of Norway, is the native city of Mr. Joachim Antonisen, city engineer of Port Arthur, Ont., who was born there on February 21, 1869. The Scandinavian people are known to possess good educational systems, and the future city engineer had all the davantages of a thorough training from his youth up. For three years he attended school at Christiana and for nine years at Bergen. He graduated from the Latin High School in Bergen in 1887, and matriculated at the University of Christiana with a view to studying medicine. It was not long, however, before he discovered that his natural bent was far removed from the sphere of medical work. He was always intensely practical and in short order he decided to come to the United States. Before leaving his native country Mr. Antonisen deemed it advisable to learn the rudiments of a trade, and he entered a large machine shop as an apprentice. For a year, also, he attended a technical institute as well as a carpentry school. Having applied himself diligently during this period it was not without confidence that, in 1888, he left for San Francisco. In that city he obtained employment in several machine shops and rolling mills, and later held a position as stationary engineer for about three years.

City Engineer Antonisen, Port Arthur, Ont.

Mr. Antonisen then went east to Kansas and worked for a year on the Kansas river under an engineer from whom he learned the first principles of surveying and engineering for the development of a water power. He next went to Ohio, where he had charge of the preliminary surveys and construction of an electric street railway between Akron and Cuyahoga Falls. From there, in 1892, the year of the World's Fair, he went to Chicago, where he obtained employment with the city surveyor, who was also of Norwegian birth. At Chicago he obtained a position as assistant to a civil engineer who had charge of the development of a water power on the Kankakee river at Wilmington, Ill. Later he went on to Keokuk, Iowa, in the service of the same engineer and made preliminary surveys for the development of a water power on the Mississippi river at Des Moines Rapids. Owing to lack of the necessary capital, the company which was making these surveys was unable to proceed with the actual work at that time. (It may be of interest to mention that a company has been organized recently to undertake the construction of a hydro-electric plant at Keokuk, capable of developing 200,000 h.p.)

After six years' practical experience in the United States, Mr. Antonisen returned to Norway and for about six months studied mathematics at Bergen. He then entered the Polytechnic University at Dresden, Saxony, where he took a four years' engineering course, making a specialty of hydraulics and municipal engineering. During his vacations from the University Mr. Antonisen obtained further valuable experience in the practice of civil engineering. Leaving Dresden University in 1898, he entered the service of the Government railways as field engineer, in which capacity he had charge of a considerable amount of responsible construction, including roadbeds, track laying and several bridges. After two years' experience in railroad engineering he became associated with the government department of river improvement and road building at Leipzig, Saxony, where he remained for four years. Mr. Antonisen considers that during this period he obtained his most beneficial experience. The city of Leipzig had requested the Saxon Government to have its engineers design a plan for the regulation of the rivers in and around the city to prevent the annual flooding of the lower parts of Leipzig. Mr. Antonisen had the good fortune to be employed on this work, which entailed a thorough study of hydraulic principles in regard to the flow of water in river channels, discharge over weirs and effect of high and low water on the operation of mills, of which there were ten or twelve in and around the city. A most thorough investigation was made and the report prepared subsequently by the engineers called for an expenditure of about $2,000,000. While at Leipzig, Mr. Antonisen was elected an associate member of the Saxon Society of Civil Engineers, an institution very similar to our Canadian society.

In February, 1905, Mr. Antonisen secured a position with the C.P.R. and left for Winnipeg, Man., where he was appointed resident engineer and placed in charge of terminals under the divisional engineer, Mr. Schwitzer. In April, 1906, he obtained the post of town engineer of Port Arthur. At the time of Mr. Antonisen's appointment the town had just started a large amount of municipal improvement and during the four years that he has held office Mr. Antonisen's duties have been of a varied and interesting character, including charge of all work in connection with streets, such as grading, pavements, sidewalks, bridges, waterworks and sewer construction and operation, water power development and electric railway construction.

A month or so ago Mr. Antonisen was appointed Utility Manager of Port Arthur. The duties of this position are defined as follows:

To supervise and control (1) Water and sewer construction; (2) Public works department, including construction, maintenance and service; (3) Water and electrical power construction, maintenance and service; (4) Electric light and telephone construction, maintenance and service; (5) Construction, extension, maintenance and operation of electric street railway: (6) Purchasing, stock-keeping and issuing of all supplies required for various departments, but all purchases exceeding $50 to be by tender and all such tenders to be first opened up and accepted by the council of the city of Port Arthur, etc.

Mr. Antonisen is an associate member of the Canadian Society of Civil Engineers and also a charter member of the American Society of Engineering-Contractors. During his regime the city has progressed in a manner that is distinctly creditable to all connected with its development. Mr. Antonisen is enthusiastic about his work, but thinks that a course as city engineer should be an eminent qualification for the diplomatic service of any country.

It is of interest to note that while he was in Germany

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The One Piece Frame and Bearings. No more shaky bearings from Bolts and Nuts working loose; much stronger, more rigid and neater than the old style Bolted Bearings.

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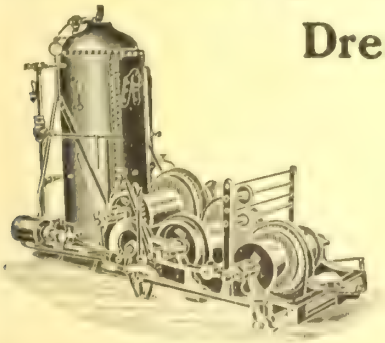
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery



Mr Antonisen married an American girl from Brooklyn. There is reported to be a little Antonisen, five years old, who already aspires to follow his father's profession.

The Late Napoleon Tessier

It is with much regret that we have to announce the death of Mr. Napoleon Tessier, Secretary of the Public Works Department, Ottawa. The late Mr. Tessier occupied the position rather less than two years, having succeeded to it in September, 1908. Death resulted after two weeks' illness from typhoid. Mr. Tessier was born at St. Cesaire, Que., in December, 1870. After a course at the St. Cesaire business college he entered the classical college of St. Laurent, from which, in 1893, he graduated in arts, taking medals also for philosophy and chemistry. In 1893 he was admitted to the bar. The degree of LL.B. was conferred upon him in 1897 by Laval University. For five years he practised law with much success at Marieville, Que.

The Late Napoleon Tessier, Secretary Department of Public Works, Ottawa.

The Passing of Old Style Macadam

In our issue of May 4th, we published an article, "A New Mixture for Prevention of Dust," which reflected upon the use of tar in road work. We have since received an interesting communication from which the following extracts are taken:

"MacAdam's science has had its day. The principles of this famous Scotch engineer have been faithfully followed for some 60 years, but the coming of the automobile has brought the period to a close. MacAdam's roads have been thoroughly satisfactory for MacAdam's traffic; but he did not build surfaces that were calculated to stand the powerful shearing action of automobile wheels.

"The modern engineer builds his roads with tarvia—a coal tar product, which gives to his surface an element of plasticity. Tarvia is a dense pitchy substance of considerable adhesive power. When it is poured over the macadam and allowed to soak in, it fills the voids and hardens into a tough elastic matrix, from which the stone particles do not come loose. The thrust of automobile wheels on this surface does not make it crumble or pulverize.

"The tarvia applications vary according to the conditions of the road, and the thoroughness with which the surface needs to be protected against automobile wear. Many roads are now being built using tarvia from the foundation up to the top. A very dense kind of tarvia, known as Tarvia X, is used. It is poured over the stones until every stone is thoroughly coated with it, and the voids are well filled. Then the smaller crushed stone of the upper course is spread and rolled into the tarviated bed. The finished surface is a mosaic—a kind of tarvia-concrete, smooth and waterproof.

"Tarvia can also be applied to roads that are built in the old way, although the application, being confined to the surface, is naturally less thorough. The kind of tarvia known technically as Tarvia A, is painted over the road after it has been carefully swept, to clean away surface dust and debris. The tarvia soaks into the macadam while it is hot, and then cools, making a tough, firm matrix for the stone."

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope, and stating number of enquiry:

736. Metal ceilings—A South African firm desires to be placed in touch with Canadian shippers of metal ceilings. Quotations to be f.o.b. Montreal and St. John; ocean freight rates to Durban and Delagoa Bay.

737. Roofing—A South African firm desires to be placed in touch with Canadian shippers of prepared roofing. Quotations to be f.o.b. Montreal and St. John; ocean freight rates to Durban and Delagoa Bay.

738. Damp-course—A South African firm of timber merchants desire to be placed in touch with Canadian shippers of damp-course. Quotations to be f.o.b. Montreal and St. John; ocean freight rates to Durban and Delagoa Bay.

739. Ventilator—A South African firm desires to be placed in touch with Canadian shippers of wrought steel louvre 6-inch x 9-inch ventilators. Quotations f.o.b. Montreal and St. John; freight rates to Durban.

750. Window frames—A Manchester firm asks for dimensions and price of window frames from Canadian manufacturers of same.

754. Agency abroad—A Liverpool firm desires to correspond with Canadian manufacturers of closet seats for the purpose of acting as sole agent in Great Britain.

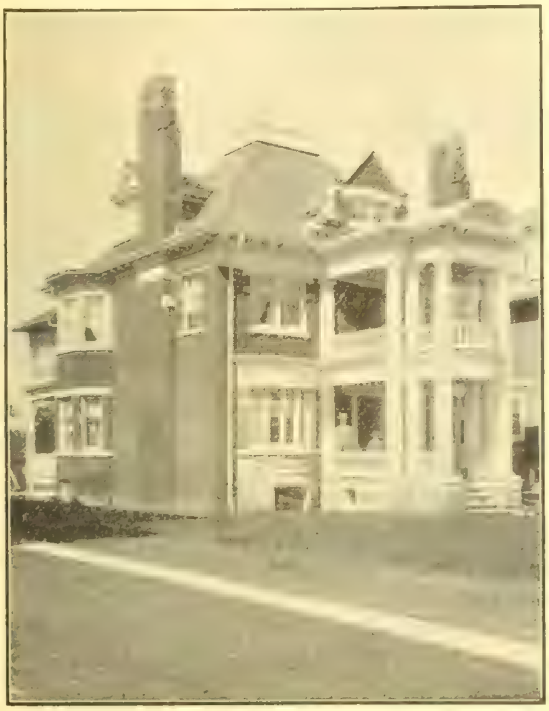
777. Expanded metal lath—A large South African firm of hardware merchants desire to be placed in touch with Canadian exporters of expanded metal lath. Ocean freight rates to East London and Durban.

805. Agents—A firm in the north of England manufacturing brick machinery, mortar mills, etc., wish to appoint Canadian representatives.

845. Agents—A Midlands company manufacturing red roofing tiles wish to obtain suitable Canadian resident agents.

Mr. Albert T. Corpe, a well known contracting painter, of London, Ont., died last week.

Mr. John Stoughton, who superintended the construction of the famous Victoria Bridge over the St. Lawrence river at Montreal, died at Detroit las tweek at the age of 67 years. Mr. Stoughton was erection superintendent for the Dominion Bridge Company, Walkerville, Ont. He was about to retire and had just purchased a large farm.



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TORONTO & WINNIPEG

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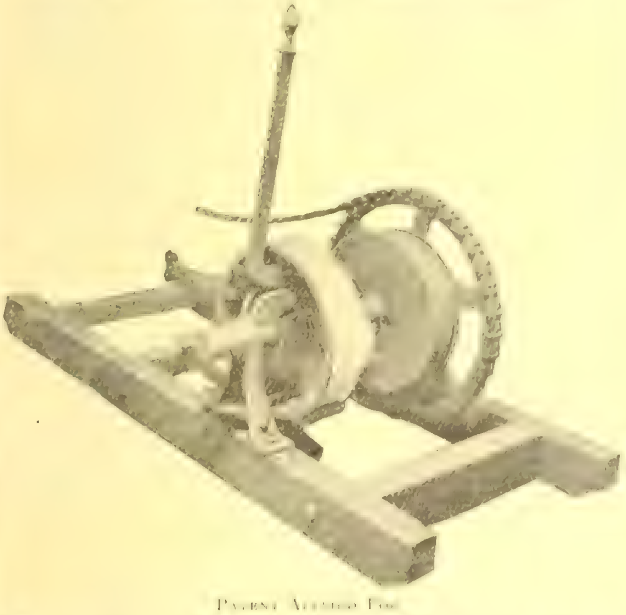

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"London" Friction Clutch Hoist

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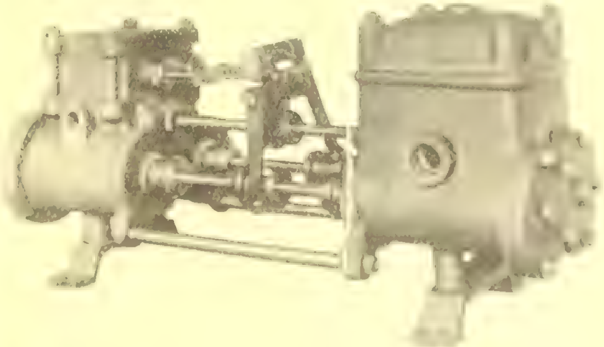

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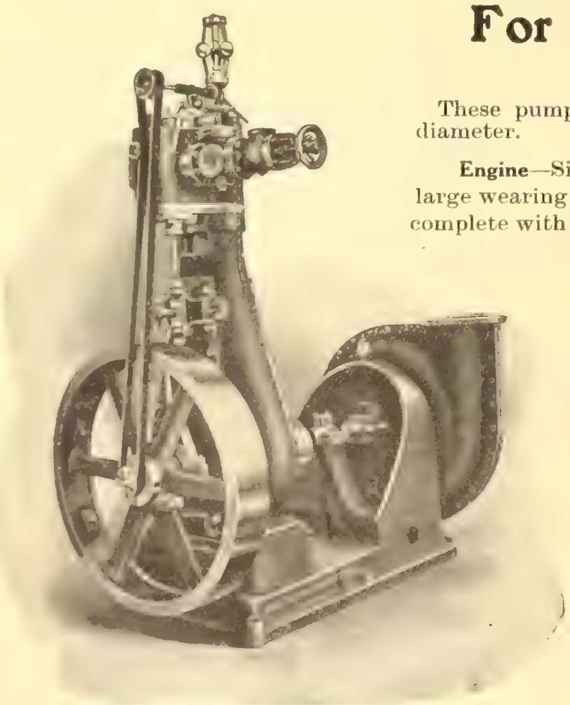

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Engine—Single cylinder, high speed, having open or closed frame, with large wearing surfaces to stand hard usage and heavy running. Furnished complete with throttle valve, lubricator and all oilers.

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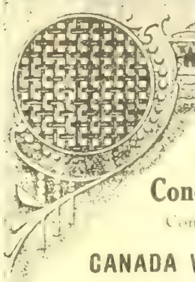

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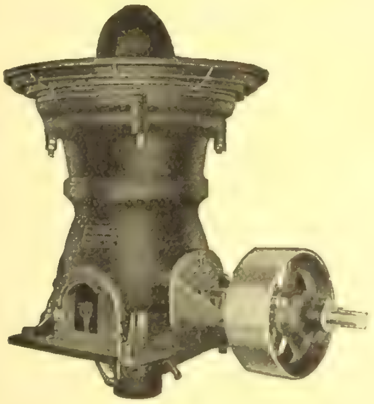

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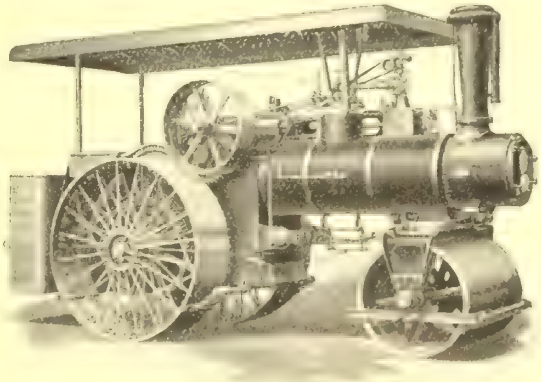

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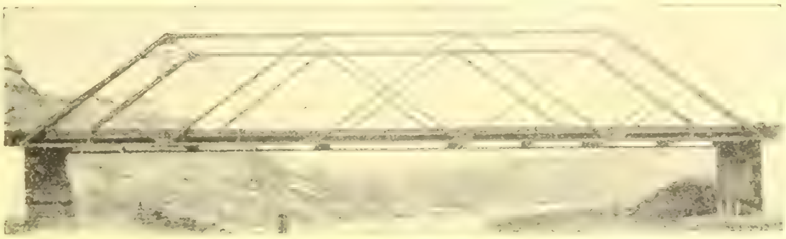

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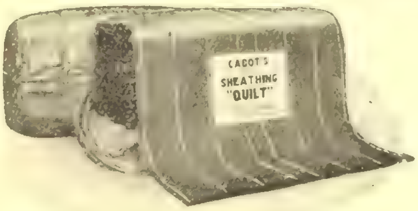

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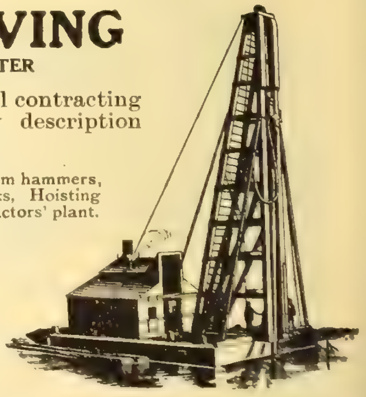

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	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from $80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D,D.
10 to 25 united inches	$4.25	$ 6,25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i,	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11,50
95 u.' i.	.,..	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex, and 3-16 inch round, 58 cents per square foot up.

Floor Tile—½-inch square 65 cents.

Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, firsts 70 cents.

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Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.

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High grade compression work, 60 per cent.

Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.

Boilers—Galvanized Iron Range.

0-gallon, standard, $4,50; extra heavy, $7.00.

CastIron Sinks

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Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

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Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

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Cement, car lots, f.o.b, Toronto, bags extra, $1.75.

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Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $14 to $15 per toise.

Free stone delivered, $14 to $15 per toise.

Brown coursing stone, delivered, $3.25 to $3,50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.25 to $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per thousand.

Steel channels and beams, $2.75 per 100 pounds, delivered, f.o.b. Toronto.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

Lime, per cwt., delivered, 38 cents,

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plaster, unsanded, $10.50; sanded $5.50;; universal finish, $15.50.

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Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $7.50 to $8.00 to $9.00 per 100 lbs.

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Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

New Companies

Dominion Box & Package Company, Limited, Montreal, Que., capital [illegible]. Incorporators, Robert C. [illegible] and Rennie O. McMurtry, advocates, Montreal, Que.

[illegible] Pulp Company, Limited, Montreal, Que., capital [illegible]. Incorporators, Wm. [illegible], merchant, and Robt. E. Elliott, [illegible], both of Montreal, Que.

Dominion Pacific Lumber Company, Limited, Montreal, Que., capital [illegible]. Incorporators, Henry V. Lovetts, K.C., and Geo. V. Cousins, accountant, both of Montreal, Que.

[illegible] Pulp & Lumber Mills, Limited, Ottawa, Ont., capital $1,500,000. Incorporators, Geo. D. Kelley, barrister, and Joseph Connolly, law clerk, both of Ottawa, Ont.

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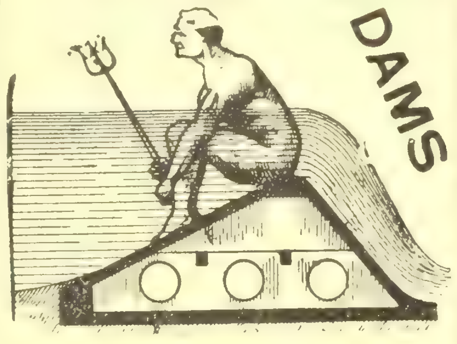

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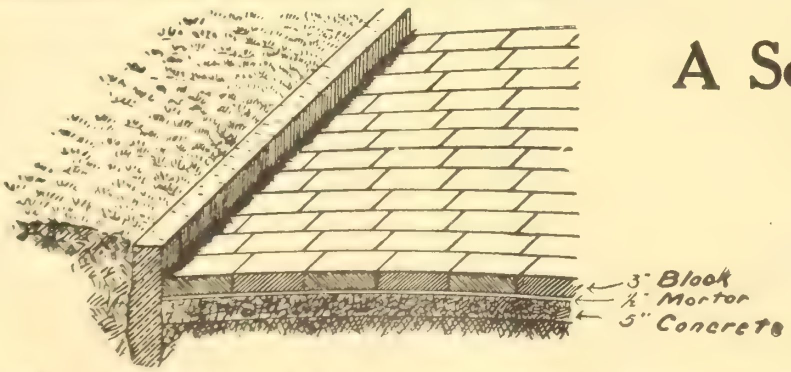

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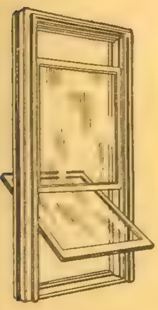

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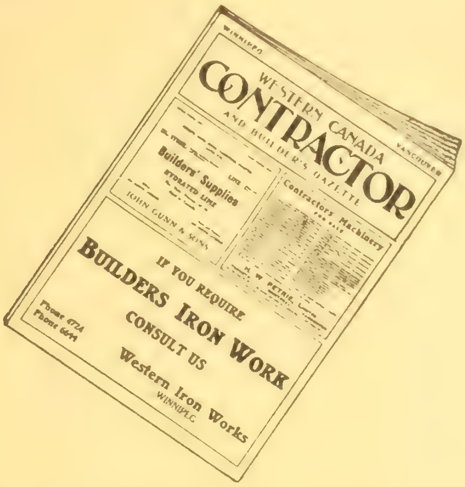

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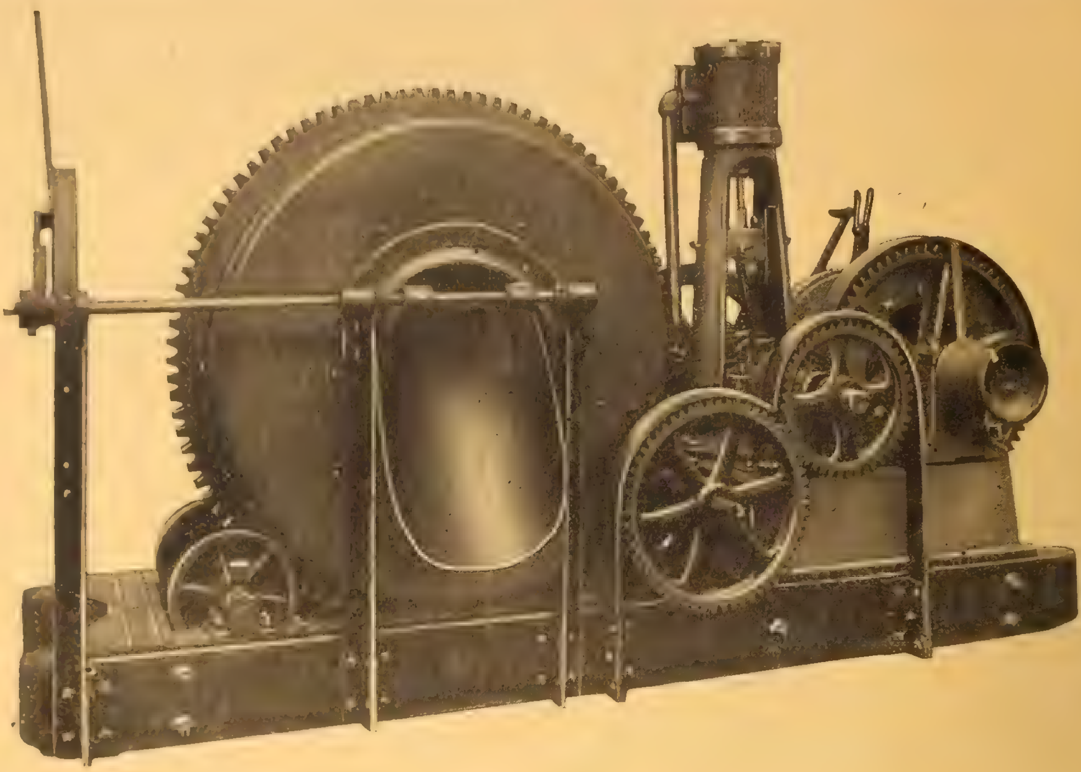

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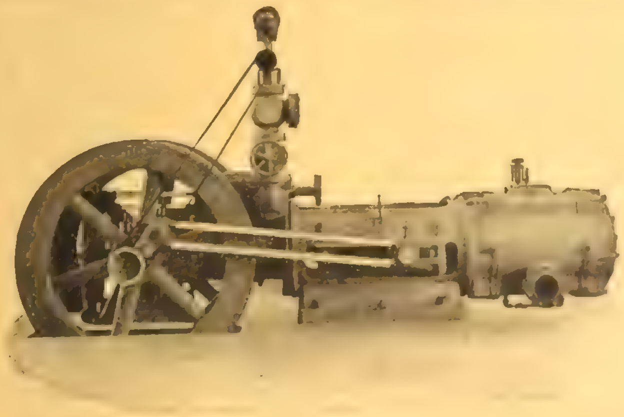

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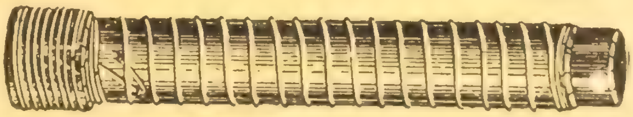

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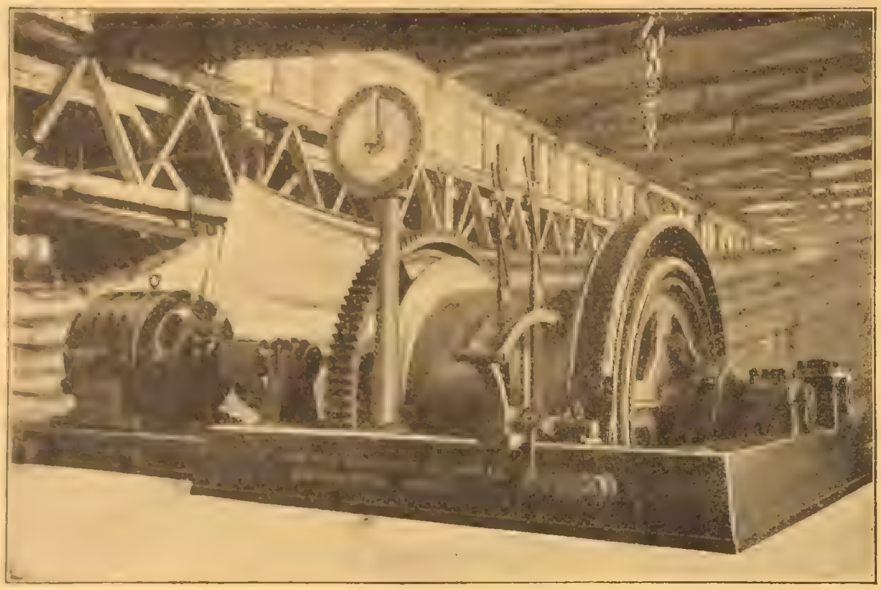

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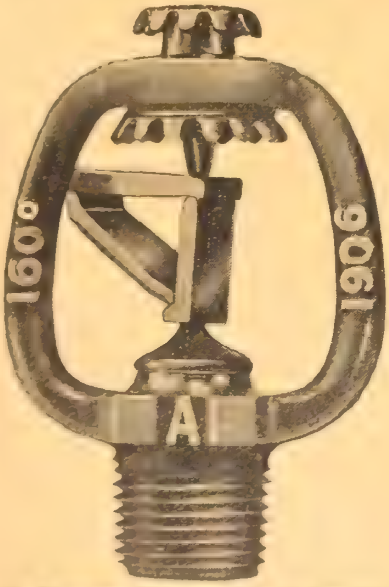

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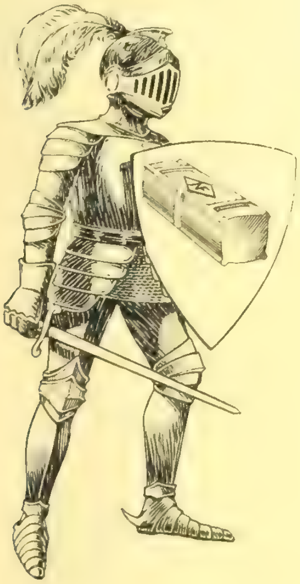

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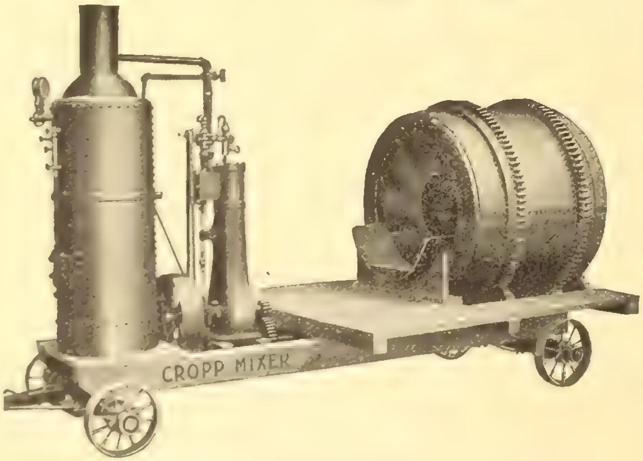

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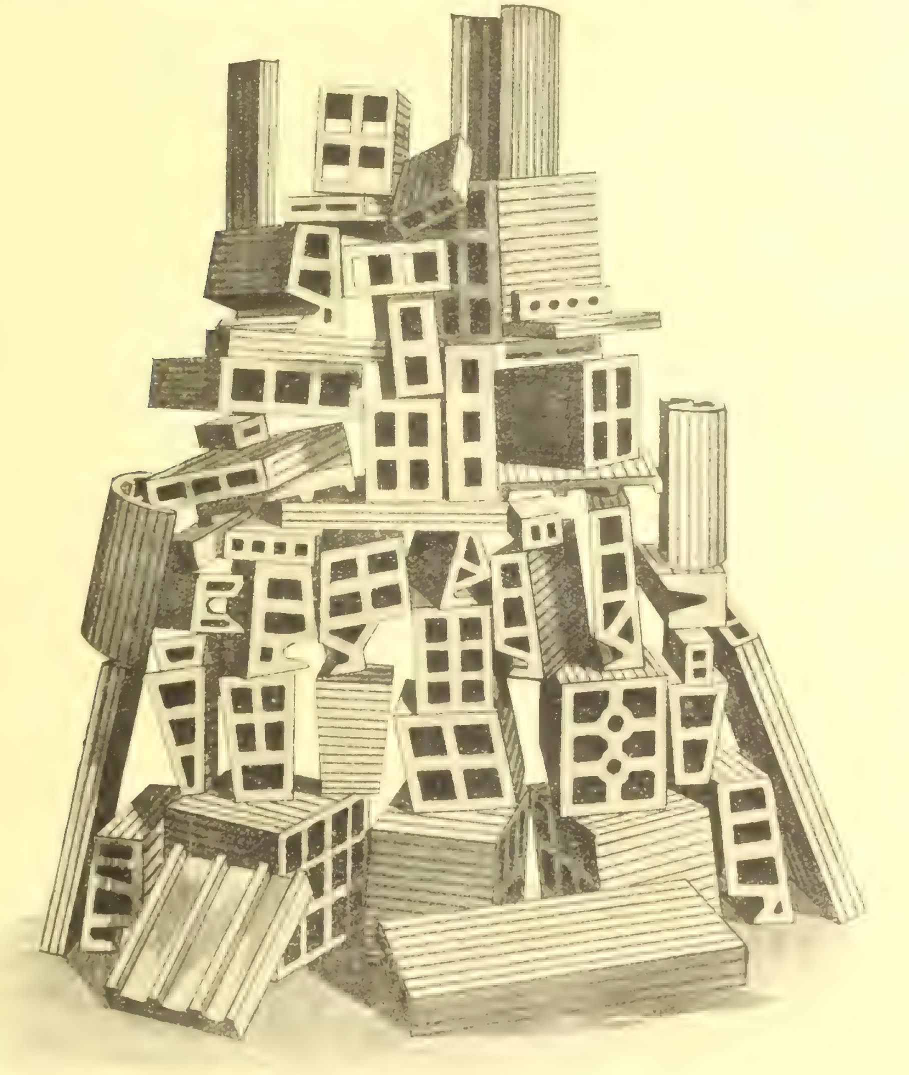

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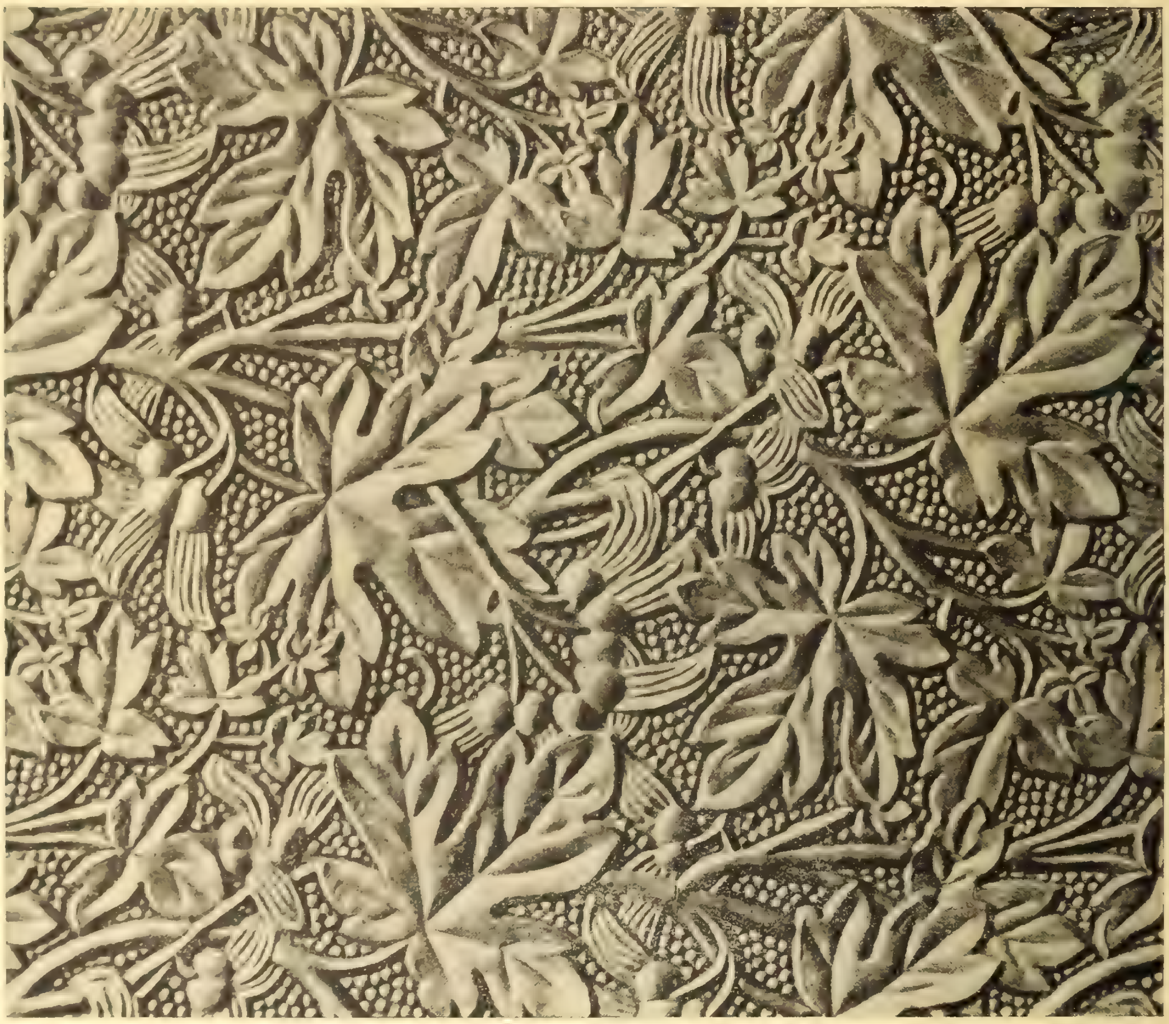

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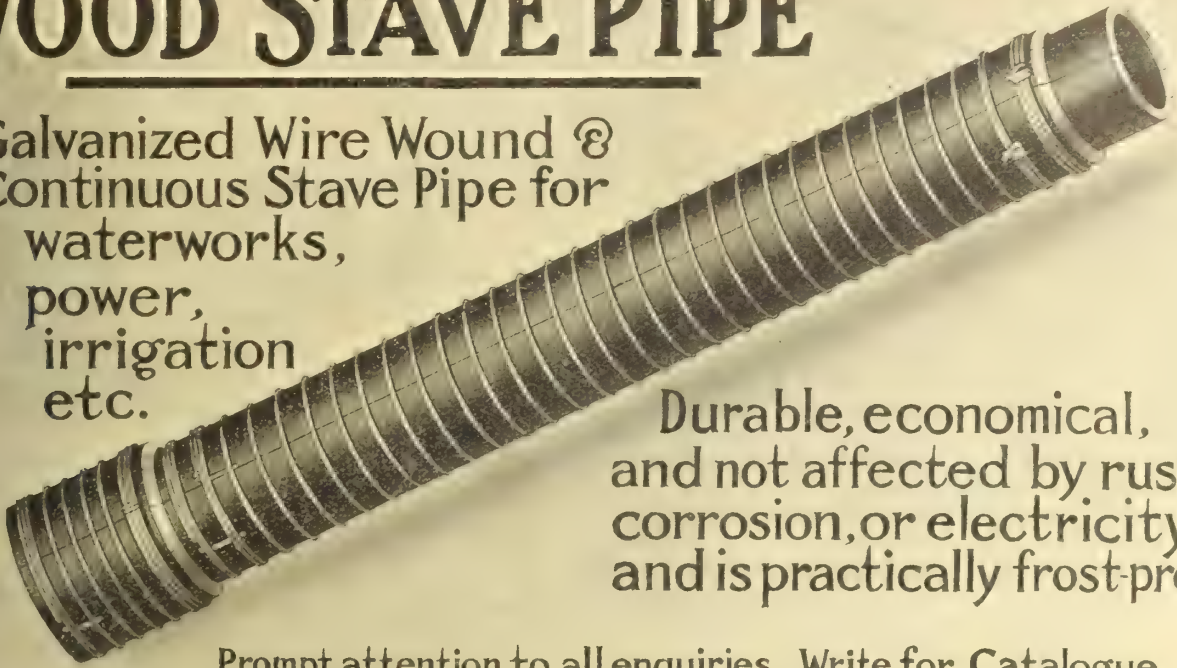

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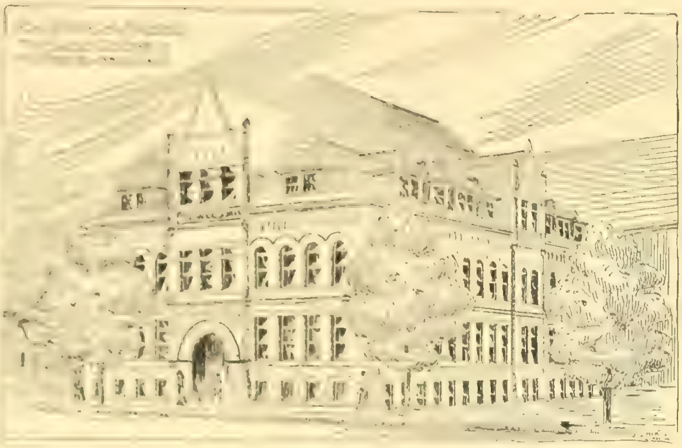

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"MIMICO" Pipe Makes the Sewer Sure

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The Advantage of the

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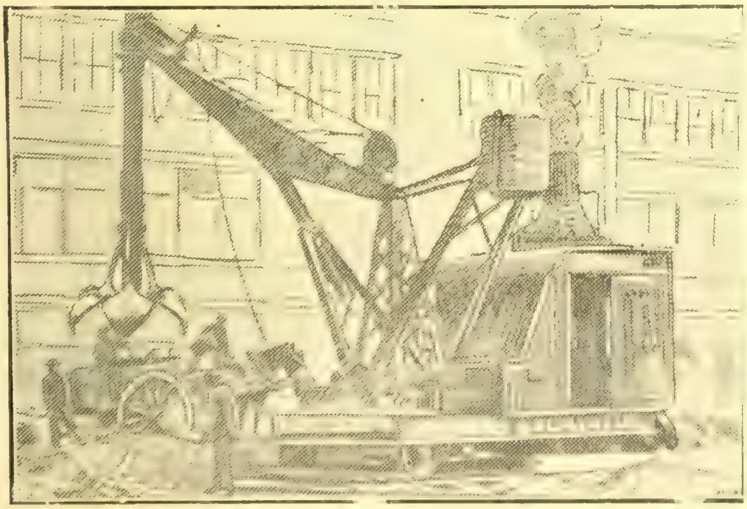

is that this machine will work under its own level to any depth down to 30 feet and to any width from 2 to 40 feet. It will work in any kind of material except hard pan.

No Contractor should be without it.

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Roofed in 1880—30 years ago.

Make Your Specifications Exact

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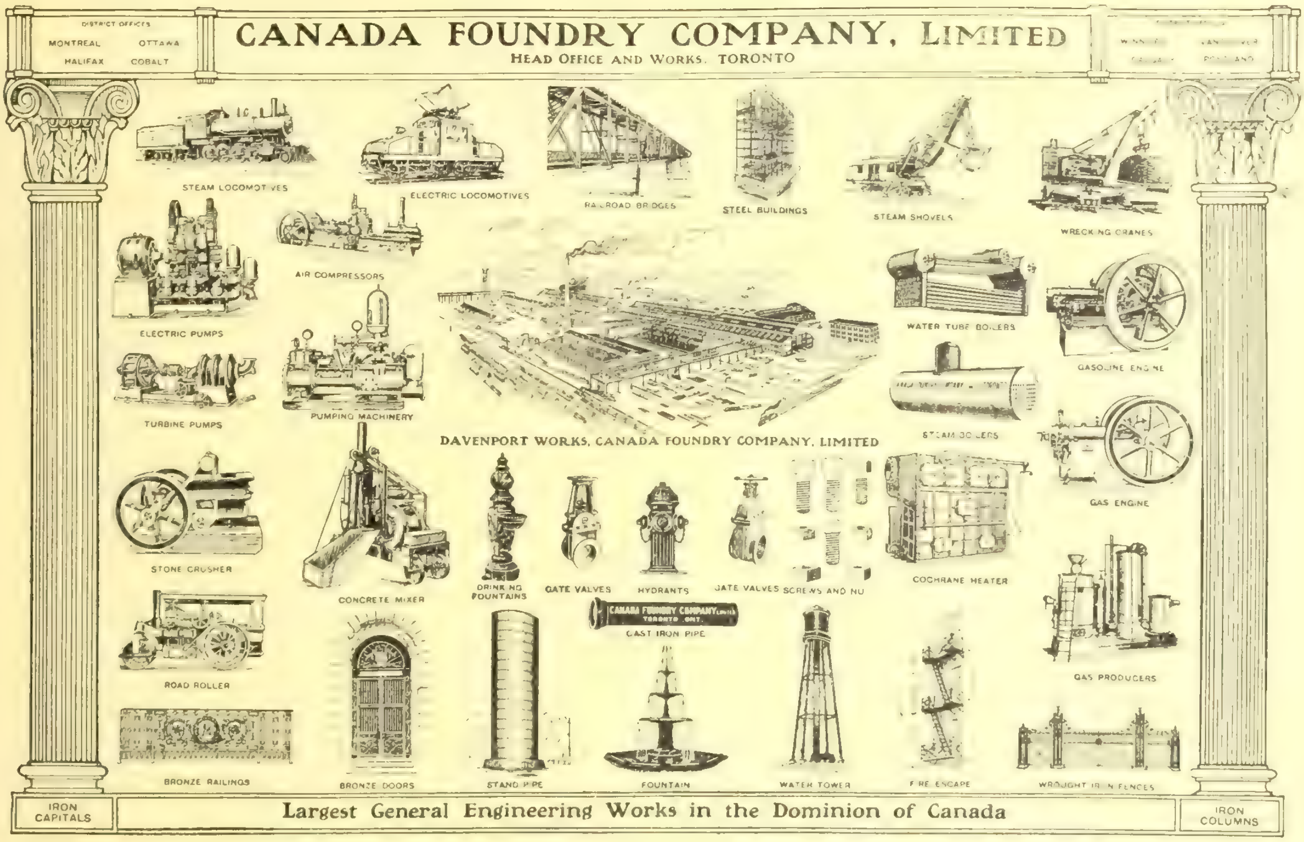

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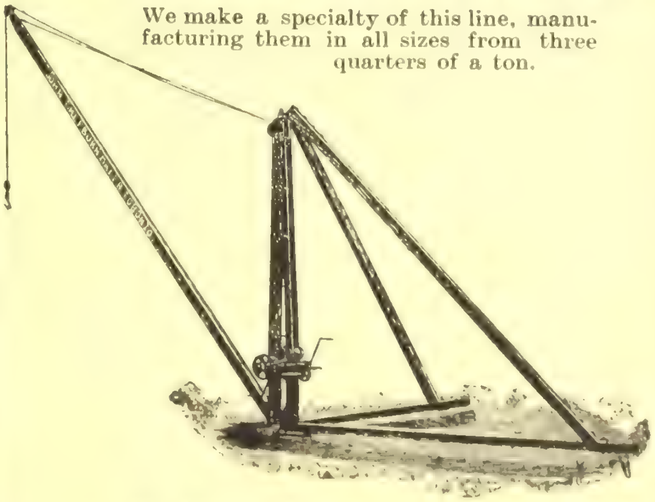
We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



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High
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For
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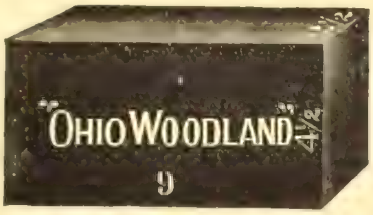

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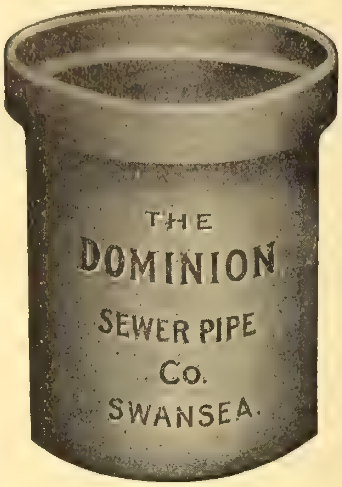

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PRACTICABILIT**Y** The **Natural Product** for **Sewers**

If **U R Y'S U** will write us **immediately** and in future SPECIF**Y** **Hamilton Pipe**

The Hamilton and Toronto Sewer Pipe Company, Limited

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"MEDUSA"

Water-proof Compound

Makes concrete impervious to water
Prevents discoloration and Efflorescence

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"Medusa" gives absolutely permanent results, will not affect strength, setting or color of Portland Cement

Write for prices and descriptive printed matter which gives full instructions for using.

Manufactured in Canada by

Stinson-Reeb Builders' Supply Co.
Limited
9th Floor Eastern Townships Bank Bldg., MONTREAL, P.Q.

We want Agents in every city and town to handle this material

WE MANUFACTURE THE HIGHEST GRADE

Hardwood Flooring

THAT CAN BE PRODUCED ANYWHERE

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

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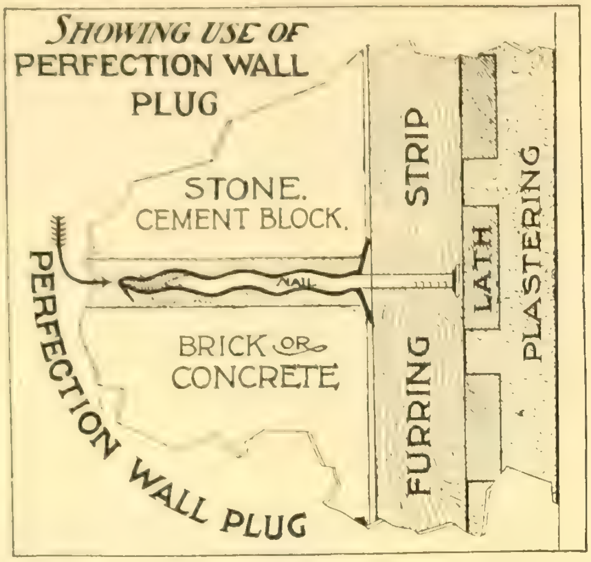
Siemon Bros., Limited
Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO



The coming attachment for furring to brick walls

Costs almost the same as a wood lath laid in the mortar joint. Infinitely better. Wood plugs (the best of old methods) can now be forgotten.

CLARENCE W. NOBLE
117 HOME LIFE BUILDING - TORONTO, ONT.

Pine Doors

We have long appreciated the fact that price is not the only requisite an architect, builder or contractor must seek in placing his order for doors. Poorly manufactured doors can scarcely be considered a bargain at any price.

Door Making is our Specialty

We have equipped our plant with the best door machinery made, and turn out doors that are right in quality and right in price.

Our doors need no commendation. They prove themselves.

Prompt deliveries. Write for prices.

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No. 872 is a Galvanized Steel Ridging at a "Wood Price"

Very few will choose to erect a wood ridge when the advantages of No. 872 are explained to them. It is much more ornamental than wood. And because it is made of galvanized steel it is several times as durable as wood. No. 872 is easy to erect. It is made on special machinery, in 10 ft. lengths, and is absolutely straight. The lengths fit together accurately. No wood filler is required. No. 872 is sold at practically the same price as ordinary wood ridge. Contractors who recommend No. 872 Ridge certainly use good judgment.

Metal Shingle and Siding Co., Limited
Branch Office and Factory, Montreal, P.Q. PRESTON, ONTARIO

You'll Never Regret It

This is the busy season for architects and contractors, preparing plans and specifications for Spring operations, be sure you recommend

Port Credit Brick

It's the make that lasts the longest, looks the best

Port Credit Brick Co.
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Home Bank Building - Toronto, Ont.
Works: Port Credit, Ont.

Dry Pressed Brick

The Dry Pressed Brick is the most artistic up-to-date permanent building material on the market. Architects and Contractors agree on this. We are manufacturing best colored, most uniform Brick on the market.

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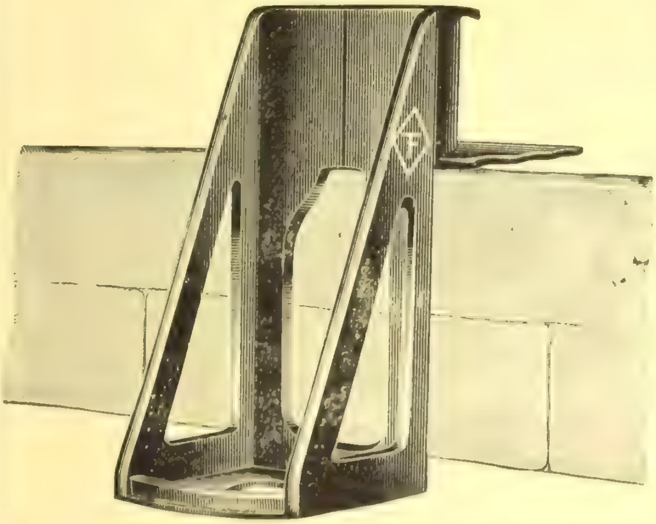
Builders' Joist Hangers

ALL SIZES AND STYLES



Wall Hangers, Post Caps and Bases

If you will use these Hangers and Caps you will save money, time, labor and timber. If you have not got a catalog we will send one on request.

We are the only MANUFACTURERS in CANADA of THIS LINE

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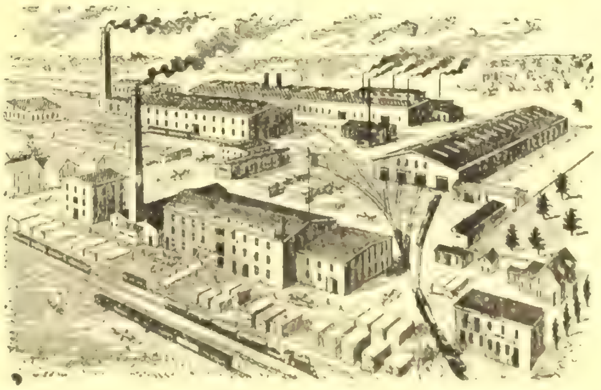

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SCHOOL DESKS A SPECIALTY

We manufacture all kinds of building materials, including cast iron columns, cresting, sash weights, etc.

In addition to our large stock of native lumber, we are now carrying about one million feet of foreign lumber, including oak, walnut, ebony, whitewood, basswood, red cedar, Douglas fir, mahogany, &c.

Rhodes, Curry Co., Ltd. **Amherst, N.S.**
BRANCHES AT
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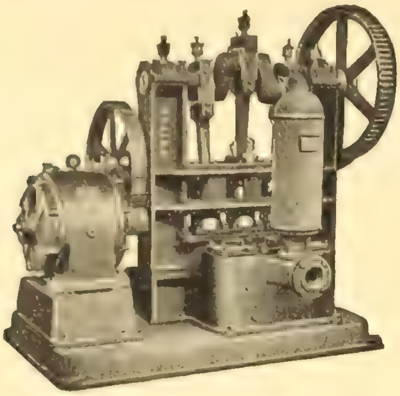
Goulds Efficient Power Pumps

Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY



Goulds Pump Co.

Coristine Building, **Montreal**
Phone Main 1054
Works: Seneca Falls, N.Y.

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"The Best Paving Block Made"

Daily Capacity 500,000

Every time **"Metropolitan Block"** are adopted it is the initial proceeding for a permanent pavement.

The Metropolitan Paving Brick Co.

Canton, Ohio, U.S.A.

50 Different Angles

To Solve

50 Different Problems

With one, or a combination of these angles **Luxfer** solves every problem of daylighting that is capable of solution.

If your client has a warehouse or store requiring more daylight to show goods in their proper color and quality, bring your problem to us.

That's what LUXFER is for

Luxfer-Prism Company, Limited

100 King Street West, TORONTO

Fertile Ground

The most profitable space to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

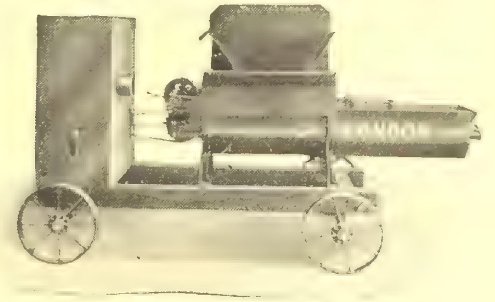
The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Automatic Batch Concrete Mixers



Made in two sizes
No. 1 capacity 50 yards per day
No. 2 " 150 " " "

Will Save You Money { **On the first cost of machine** / **On cost of operation** / **On cost of mixing concrete**

OUR AUTOMATIC MIXERS do **perfect measuring** and **mixing** with **any kind of material, measure any proportion,** and give **any consistency of moisture.** Materials only handled once. **Less men required to operate.** Send for catalogue and state capacity desired.

We also manufacture a STANDARD DRUM BATCH MIXER in three sizes, one-third yard, one-half yard and one yard. The most complete Drum Mixer out. We have everything in the line of Concrete Machinery and Cement Working Tools. Tell us your requirements.

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19 Marmora Street, London, Canada Limited

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We are the largest manufacturers of Concrete Machinery in Canada.

"Empire Brand"

ensures a perfectly smooth hardwood floor which will be "a thing of beauty and a joy forever." If you want your clients to speak of you as "a fellow who always uses the best materials obtainable," specify

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Montreal Agent. THE HARDWOOD FLOORING CO.,
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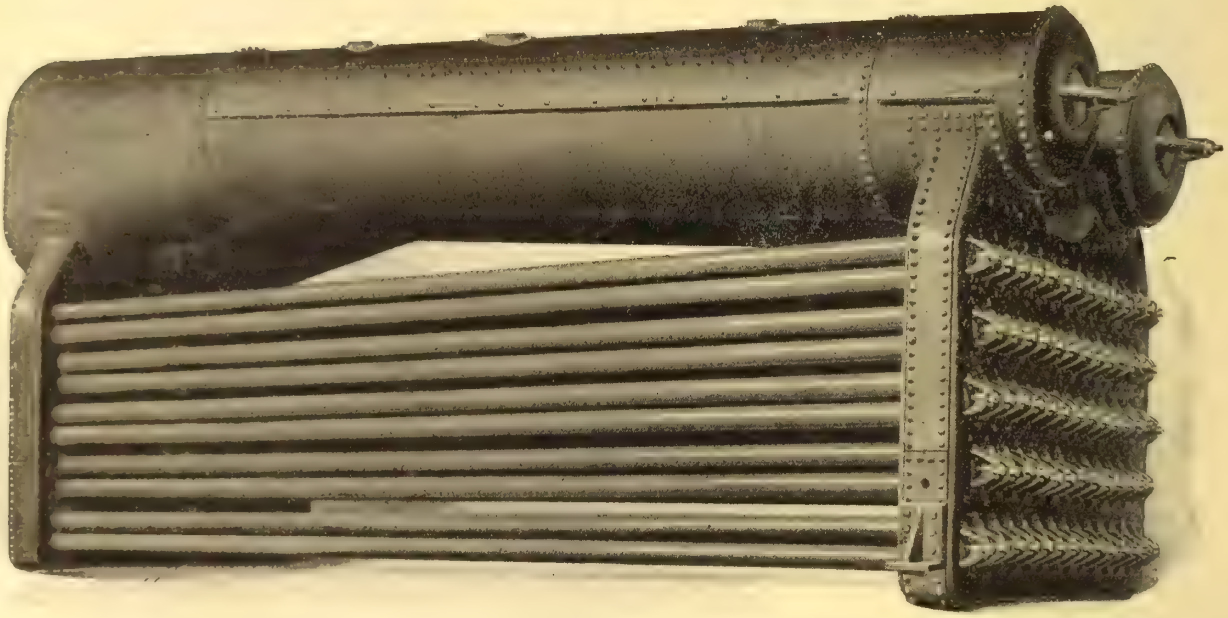
Water Tube Boilers

that are

Safe - Durable - Economical



ERIE CITY WATER TUBE BOILER WITH TWO DRUMS

Erie City Water Tube Boilers are "SAFE," "DURABLE" and "ECONOMICAL" because they are properly designed and built in the beginning. Continuous operation for many years has culminated in a thorough system of production, and inspection carried out in all details by officers and mechanics, many of whom have made this business their life work. With such recommendations we confidently solicit the confidence of our customers. If this interests you, write us for catalogue and full particulars.

The John Inglis Company Limited

ENGINEERS AND BOILERMAKERS

Canadian Manufacturers of Erie City Water Tube Boilers

14 Strachan Avenue - - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Brandon, Man.

Tenders addressed to W. Bowling, chairman of waterworks, will be received until June 17th for the construction of a filter building at the pumping station. Plans, etc., at office of the city clerk.

London, Ont.

Tenders are invited for $357,882 artesian well system, waterworks and Niagara power debentures.

Ladner, B.C.

Tenders addressed to N. A. McDermid, C.M.C., will be received until June 17th for the following material and work: Electric pumping engine, 350 gallons per minute; wire-wound wood pipe, about 50 miles; valves, hydrants and special castings; hauling and laying pipes, etc. Plans, etc., at office of T. H. Tracey, consulting engineer,

Montreal, Que.

The city council have accepted the reports of the Board of Control and have voted $499,800 for sidewalk and $788,958 for street pavements. Successful tenderers previously mentioned.

Medicine Hat, Alta.

It is stated that terra cotta sewers are to be constructed at a cost of $35,000 by day labor, and also about $35,000 worth of paving is to be done by the city, mostly concrete sidewalks. A. K. Grimmer, city engineer.

Nanaimo, B.C.

Tenders are being called until June 24th for excavation and laying only of vitrified sewer pipes, with outfalls in harbor, etc. For further information see advertisement in "Tenders and For Sale Department" of this issue.

The bylaw to raise $25,000 for the purpose of extending the outlet of South Forks pipe will be submitted shortly.

North Vancouver, B.C.

City Engineer Hanes was instructed by the council to go ahead with plans for the installation of the first units of the sewage system in the city and to submit them to the government for approval.

Oakville, Ont.

This municipality have authorized T. A. Murray to prepare plans for sewerage disposal.

Regina, Sask.

The city council recommended that the construction of the north portion of the trunk sewer be undertaken by the engineering department. A. L. McPherson, consulting engineer, estimated the work at $187,000. The tenders submitted were as follows: Parsons Construction Company, total amount, $271,466.10; Parsons Construction Company, Meriwether Construction, $226,657.91; Wm. Newman & Company, $250,481.70; Wm. Newman & Company, Meriwether Construction, $261,451.15; A. C. Stewart & Company, Winnipeg, $239,638.65; Wm. Hurst, Winnipeg, $208,463.14. Estimated total cost of work by figures to date for cement and reinforcement. Monolithic Construction — Construction contract, Wm. Hurst, $208,463.14; Cement, 11,500 barrels, $31,050; reinforcement, $12,300; junctions, $536.64; total, $252,349.78. Meriwether Construction—construction contract, Wm. Hurst, $208,463.14; cement, 7,750 barrels, $20,925; reinforcement, $17,220; junctions, $536.64; tital, $247,144.78.

St. Thomas, Ont.

Board of Water Commissioners decided to ask council to issue debentures for $40,000 to cover proposed extensions.

Strahtcona, Alta.

Tenders were called by this municipality for street paving until June 14th. A. J. McLean, city engineer.

St. John, N.B.

Tenders will be called shortly for the balance of paving work to be done next year.

Smiths Falls, Ont.

This municipality is calling for $16,000 waterworks debentures, 30-year, 5 per cent. Also local improvements debentures. J. A. Lewis, town clerk.

St. Catharines, Ont.

The council have decided to have the sidewalks and curbs this year laid by day work, and the city will buy a cement mixer.

Tofield, Man.

The bylaw to spend $4,000 on preliminary work for waterworks, and $3,500 on sidewalks, was carried.

Vancouver, B.C.

Tenders addressed to Wm. McQueen, city clerk, will be received until June 29th for lining the Little Mountain Reservoir. Plans, etc., at office of Messrs. Hermon & Burwell, engineers, 423 Hamilton street, or at the waterworks office.

The contract will be one of considerable magnitude as the reservoir has a capacity of 21,000,000 gallons. Its size is 350 by 450 feet about the rim, the sides sloping to a bottom, the perpendicular depth being 25 feet, 270 by 450 feet in dimension.

Walkerville, Ont.

Owen McKay, township engineer, will reseive tenders until June 17th for dredging Little River Drain. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

Wingham, Ont.

J. T. Jones, town clerk, will receive tenders until June 21st for the construction of sewers and sewage disposal work. Davis & Johnson, Berlin, engineers. For further particulars see "Tenders and For Sale Department" of this issue.

Winnipeg, Man.

Tenders are being called by the Board of Control until June 16th for supply of quantity of sewer pipe and junctions. Specifications, etc., at office of City Engineer M. Peterson, secretary, Board of Control. Also for supply of from 25,000 to 30,000 barrels of cement, to be delivered, f.o.b. city yards.

The board of control has been instructed to purchase a Linkbelt asphalt mixer for use in laying asphalt macadam pavements: estimated cost, $8,000.

The Board of Control are calling for tenders until June 16th for construction of the following: sewers, granolithic walk, cedar block pavement, asphalt pavement, creosote block pavement, water main. M. Peterson, secretary.

AWARDED.

Burnaby, B.C.

The Brouse-Mitchell Co., of Vancouver, has secured the contract to construct waterworks for this town.

Crystal City, Man.

The contract for granolithic pavement has been let to A. E. Dobson, of Manitou.

Finch, Ont.

D. G. McMillan, of Finch, was given the contract for the construction of the Johnston drain at the following prices: Earth, 17 15/16 cents per cubic yard; hard pan, 90 cents; rock, $2; reinforced concrete culverts, $13.69 a cubic yard.

Fort William, Ont.

Tenders on sewers were received sa follows: Atlo & Jacobson, 10 and 12, $13,297; E. S. Rutledge, 10 and 11, $51,685, 10 and 12, $12,886, 10 and 13, $18,288, 14, $4,675; T. McCallum, 14, $3,900; Stewart & Hewitson, 10 and 11, $51,750; Stewardson Bros., 10 and 11, $60,761, 10 and 12, $12,759, 10 and 13, $16,280, 14, $4,700; Laidlaw & Grant, 10 and 11, $54,000; C. Donati, 10 and 12, $12,900; A. Cameron, 10 and 11, $64.145, 10 and 13, $29,681, 10 and 13, $23,525, 14, $4,529; H. Murphy, 10 and 11, $62,000, 10 and 12, $17,000, 10 and 13, $27,550, 14, $5,200; J. J. Flanagan, 10 and 11, $51,000, 10 and 12, $13,750, 10 and 13, $22,500, 14, $4,000; H. S. Hancock, 10 and 11, $49,500, 10 and 12, $13,140, 10 and 13, $18,951, 14, $4,315. T. McCallum was awarded the contract for sewer, 10—14 at $3,900. Stewardson Bros. were awarded the contract for sewer 10—13 at $16,280, and contract for sewer 10—12 at $12,759. The work on Francis street sewer was awarded to engineer at his tender, $49,500.

Hull, Que.

Messrs. Carriere & Wilson have been awarded the contract for the construction of the new sewer on Champlain avenue for $2,850; other tenderers, Malette & Lambert, $3,403; Jas. Thomas, $2,948. E. Thomas, this city, was given the contract for the construction of new concrete side-walks at [illegible] cents per square foot.

Kingston, Ont.

The British American Oil Company was given the contract of [illegible] at 5 cents a gallon, in barrels, f.o.b. Toronto.

London, Ont.

The tender of the Barber Asphalt Company for a pavement on Ridout street, from King to York, for $3,792, was accepted.

Lethbridge, Alta.

The city council has awarded a contract to the Forest City Paving Company for 27,000 square yards of cement.

Nanaimo, B.C.

The contract for constructing eight miles of concrete walks was given to W. H. Worswick, of Victoria. Prices noted in last issue.

Ottawa, Ont.

The council accepted the recommendation of the Board of Control for award of contract for pavement on Bank and St. Patrick streets. Noted in last issue.

The following tenders were received for the supplying of ten flexible cast iron joints as per plans and specifications, in connection with the new intake pipe: Gordon Law, Ottawa, $1,650 (accepted); Victoria Foundry, Ottawa, $1,950; Wm. Hamilton Company, Peterborough, $2,080; Staveley Coal & Iron Company, Limited, Chesterfield, England, $2,475; John Inglis Company, Toronto, $2,590; Chaudiere Foundry Company, Ottawa, $2,680; Thos. Lawson & Sons, Ottawa, $3,250; Canada Foundry Company, Toronto, $3,300.

St. John, N.B.

Robert S. Low, Sydney, N.S., has been awarded the contract for granite block paving in St. John, N.B., about $70,000. Contracts for supplying castings for the department were awarded to J. E. Wilson, Limited, the lowest tenderer. Tenders for supplying 500 barrels of English Portland cement were opened and the following bids disclosed: C. H. Peters Sons, Limited, $1.97 a barrel; W. H. Thorne & Company, $1.75 (acepted); A. M. Rowan, $1.85; Charles Nevins, $1.95; Gandy & Allison, $1.89 a barrel or $1.94 in casks of 150 pounds. The only tender for supplying 100,000 bricks was from John Lee & Company, at $9.50 a thousand (accepted). Tenders for castings were opened and the following bids disclosed: McLean, Holt & Company, 40 main stop cock vault taps, $6.69 a set; sixty cast iron sewer manholes, $6.44; twenty catch basin frames, $2.59 each; J. E. Wilson, Limited, vault tops, $6.45; sewer manholes, $6.25; catch basin frames, $2.45; J. Fleming, vault tops, $6.80; sewer manholes, $6.40; catch basin frames, $3.20; St. John Iron Works, vault tops, $6.45; sewer manholes, $6.45; catch basin frames, $3.59. The tender of John E. Wilson, Limited, was accepted.

Tenders for core castings were opened and the following were the bids: James Fleming, 3 4-10 cents a pound; St. John Iron Works, 3½ cents; J. E. Wilson, Limited, 3¼ cents, and McLean, Holt & Company, 3½ cents. The tender of J. E. Wilson, Limited, was accepted.

Virden, Man.

The Manitoba Hardware & Lumber Company were given the contract for supply of 800 barrels cement, f.o.b. cars, Virden, at $2.91 per barrel, with sacks. A. B. Cunningham, Melville, Sask., tendered at $2.99 per barrel, with sacks; Rat Portage Lumber Company, this place, at $2.90 per barrel, without sacks.

Vancouver, B.C.

The following tenders for Broadway grading and bulkhead from Scott to Glen, were received: M. P. Cotton, $17,656; J. D. Cameron (bulkhead only), $5,900; T. R. Nixon & Company, $8,500 (both); Palmer Bros. & Henning, $12,370; H. V. Tucker, $10,170. Nixon's tender was accepted.

The following tenders were received by the Board of Works for the concrete and brick sewers: Palmer Bros. & Henning, $26,000 (city yard to Dufferin); $64,155 (Seventh avenue); $69,750 (Tenth to Sixteenth avenue). M. P. Cotton, $24,000, $57,000 and $79,284, respectively. L. Placa Bros., $39,721 (Seventh avenue). The tender of La Placa Bros. for Seventh avenue was accepted. The city engineer was instructed to do the rest of the work by day labor.

Railroads, Bridges and Wharves

Chatham, Ont.

The extension of the C. W. and L. E. from Chatham to Pain Court will be proceeded with at once, the Railway Commission having granted the order.

Collingwood, Ont.

Tenders will be received until June 25 for the construction of a reinforced steel arch bridge on the town line, etc. Plans, etc., at office of John Wilson, arcnitect.

Edmonton, Alta.

Engineers are running the final locations for the C. P. R. high level bridge this week, and it is expected that construction will start at once. Estimated cost, $500,000.

Fergus, Ont.

Tenders will be received until June 22nd for the construction of nine reinforced concrete bridges and culverts, and for abutments, steel deck and concrete floor on the Moorefield bridge. Bowman & Connor, county engineers, 36 Toronto street, Toronto.

Fort William, Ont.

Tenders on Simpson street bridge were received as follows: S. Moran, $22,000; A. Cameron, $23,545; E. G. Penniman, $29,500; J. J. Flanagan, $24,500; H. Murphy, $26,200. The city engineer estimated at $20,000 and $22,000. The city engineer was instructed to build the Simpson street bridge by day labor.

Hampton, N.S.

Tenders are being called by the Public Works Department, Ottawa, for extension to breakwater. Plans, etc., at offices of the above; C. E. W. Dodwell, Halifax; E. G. Millidge, Antigonish, and on application to local postmaster.

Lethbridge, Alta.

The council accepted the proposition of the C. P. R. and Alberta Railway & Irrigation Company to bear half the cost of an overhead bridge over the railway tracks; cost about $90,000.

Longueuil, Que.

The Montreal Central Terminal Company have submitted plans to the council for a connecting line between Longueuil and Montreal. They propose to tunnel under the river at the lower end of St. Helen's Island to connect with the Grand Trunk and Central Vermont and other lines at Montreal.

Ruskin, B.C.

It is reported that the Western Canada Power Company has awarded the contract for grading seven miles of standard gauge from here to Stave Falls to Messrs. Morrisey, Smith & McLean.

Sackville, N.B.

Tenders are being called by the Department of Public Works, Ottawa, until July 4th for the construction of wharf here. Plans, etc., at the above department and at offices of E. Shewen, St. John, G. Stead, Chatham; and on application to local postmaster.

Smith's Falls, Ont.

The C. P. R. will spend about $50,000 on bridges here.

Toronto, Ont.

It has been announced that the T. H. & B. would be double tracked. Estimated expenditure, $1,000,000. Superintendent, Adams.

Winnipeg, Man.

The C. P. R. is preparing to continue the double tracking of the line between Portage and Brandon. The completion of this work will give the C. P. R. 522 miles of double track.

AWARDED.

Drayton, Ont.

Tenders for bridge work were awarded by the engineers, Messrs. Bowman & Connor, Toronto and Berlin, as follows: Cole's bridge, 50 foot steel structure, superstructure, Hunter Bridge & Boiler Company, Kincardine, Ont., $850. Eight bids were received, ranging from $850 to $1,154. Abutments, 120 cubic yards, Jno. D. Callaghan, $564. Six bids were received, ranging from $564 to $670. Arnold bridge, sub-structure, 233 cubic yards, Jno. D. Callaghan, $1,171. Seven bids, ranging from $1,171 to $1,943, were received. Stirton culvert (10 feet), Simmons Bros., $374. Eight bids were received, ranging from $339 to $625.

London, Ont.

The contracts awarded were as follows: Kenilworth Bridge — Concrete, R. Waltham, $3,265, next lowest, Chas. Ferguson, $3,225; steel and iron work, Hamilton Bridge Company, $8,100, Western Bridge & Equipment Company, $7,850. Caverhill Bridge—Concrete, superstructure and floor, D. Witherspoon, $580, next lowest, L. O'Dell, $624; steel superstructure, Western Bridge & Equipment Company, $550, next lowest, Petrolea Bridge Company, $680. McGillivray — Reinforced concrete, E. Talbot, $525, next lowest, Chas. Nickle, $526.50. Meadow Lily bridge over the Thames river, as follows: Steel work, Hamilton Bridge Company, $5,266; concrete, L. Crouse, $3,090. R. P. Piper, was appointed overseer.

Montreal, Que.

The Dominion Bridge Company, of Lachine, were the successful tenderers for the construction of a new bridge at Lachine for the Canadian Pacific Railway Company. Work will be proceeded with shortly and will be spread over a period of two years.

Narva, Ont.

C. S. Wood, of Tiverton, was awarded the contract for the construction of a two-span flat arch bridge, eighty feet long, by the Township of Greenock, at $2,779. Other tenders were: A. Knox, Pinkerton, $1,950; Wm. Wittman, Chepstow, $2,741; John Coumans, Chepstow, $2,787; David Keyes, Kincardine, $2,762; Hunter Bridge Company, Kincardine, $2,945; J. Reid, Brantford, $3,375.

Prince Rupert, B.C.

Foley, Welch & Stewart have been awarded the work of building twenty-five miles of the line of the Kootenay Central Railway.

Weston, Ont.

E. C. Lewis, of Toronto, was given a contract by this municipality for the construction of a 118-foot span concrete arch bridge. Barber & Young, Toronto, consulting engineers.

Woodstock, Ont.

We are informed that the contract for two county bridges on the 10th line of East Nissouri has been awarded to Wm. Crellin, of Kintore, for $1,460. F. J. Ure, C.E., city engineer.

Public Buildings, Churches, Schools, etc.

Brandon, Man.

The ratepayers will be asked to vote shortly on the expenditure of $25,000 for the new central fire hall, and also $20,000 for the construction of city hall.

Chilliwack, B.C.

A bylaw will be submitted to the ratepayers shortly for the erection of city hall, etc. Noted in last issue.

Plans for the new post office have been prepared and site secured. Estimated expenditure, $30,000.

Calgary, Alta.

The Horse Show Association will ask the city council to submit a bylaw to the ratepayers for the expenditure of $55,000 for the erection of a first class building and for the improvement of the present stabling accommodation.

Chatham, N.B.

The preliminary plans for the new Roman Catholic college are well advanced. It is understood it is to be under the the direction of the Basilian Fathers, of Toronto.

Cranbrook, B.C.

The council will purchase lots on Norbury avenue upon which to erect a municipal building and fire hall.

Dauphin, Man.

The $12,000 bylaw for school buildings, etc., was carried.

Durham, Ont.

Tenders addressed to W. B. Vollet, town clerk, will be received until June 17th for the erection of clerk's office.

Dresden, Ont.

Tenders addressed to J. P. Bridgewater, secretary, Public School Board, will be received until June 20th for the erection of a concrete, brick school, etc. Plans at offices of the above, or of the architects, J. L. Wilson & Son, Chatham.

Edmonton, Alta.

A new Presbyterian theological college will be established here.

The specifications and plans of the new city hospital are completed and as soon as the city council passes the vote granting the necessary funds, the contract for construction will be awarded, probably about the 20th inst.

Fort William, Ont.

Tenders addressed to R. E. Mason, architect, will be received until June 16th for the erection of north wing hospital for the Board of Health; also for a boiler house and heating plant.

Gretna, Man.

Ratepayers have carired a $12,000 school bylaw.

Hanover, Ont.

Tenders for erection of town hall will be called for by Forster & Clark architects, Owen Sound.

The bylaw granting $13,000 for the erection of town hall was carried; plans are being prepared for the public library, on which $10,000 will be spent.

Lethbridge, Alta.

Tenders addressed to J. Stocks, deputy minister of public works, will be received until June 30th for plumbing, electric wiring, ventilations and mechanical equipment in connection with jail building here.

Montreal, Que.

The Grey Nuns have purchased the property, southwest corner Sherbrooke and St. Lawrence Boulevard for $135,000 from the Molson Estate, and this will be converted into a hospital building.

North Vancouver, B.C.

The plan of Messrs. Hope & Barker was accepted for the new school. Plan calls for eight rooms with full basement of brick, and rough cast, with concrete foundation and provides for wings.

Napanee, Ont.

Tenders for the complete construction of a skating rink will be received until June 15th. C. M. Warner, secretary.

Niagara Falls, Ont.

The city council decided to submit three bylaws to raise money: one for $15,000 to build a new assembly hall, gymnasium and collegiate; another for $2,000 to repair the heating at the collegiate, and the third to raise $2,500 to build a new fire hall.

Owen Sound, Ont.

Tenders will be called shortly for erection of an addition to General Hospital and Nurses' Home. Forster & Clark, architects.

Orillia, Ont.

Out of the $35,000 to be raised in the building campaign for the Presbyterian church, $20,000 will be spent on a new school room.

Ottawa, Ont.

It is expected that the matter of a municipal abattoir will be taken up when the new incinerator is completed.

Portage la Prairie, Man.

Owing to a mistake in the tenders for the new school, the board will call for new ones to be in by the 15th inst.

Quebec, Que.

Tenders for roofing the Civic Hospital were called until June 15th. W. D. Baillairge, city engineer.

Ridgeville, Ont.

Tenders are invited for $9,000 school debentures. A. N. Armhurst, township clerk.

Renfrew, Ont.

Tenders are being called until June 24th for the various trades, including heating and plumbing, required in the erection of an eight-room addition to the Renfrew Model School. Geo. Eady, Jr., secretary, Board of Education.

Regina, Sask.

Tenders will be received until June 18th for the erection of Officers' Quarters at the R. N. W. M. P. Barracks. Plans, etc., at office of Messrs. Storey & Van Egmond. R. S. Knight, inspector, supply officer.

The Board of Governors of Saskatchewan Methodist College have decided to purchase eighteen acres of the present jail property from provincial government, on which they will erect their proposed college. Plans, etc., will be submitted to the government for approval.

Sudbury, Ont.

L. O. Connor, mayor, will receive tenders until June [illegible] for the various trades required in the erection of a municipal building. For further particulars see "Tenders and For Sale Department" of this issue.

South Vancouver, B.C.

The $179,000 schools bylaw was carried.

The plans and designs of three new schools submitted by Mr. J. H. Bowman, architect, were accepted. The cost of the three new schools totals about [illegible].

Stewart, B.C.

Plans for the new government court house and police station have been received by Government Agent McMullen. Construction will start at once.

Springdale, B.C.

Tenders are being called by the Department of Public Works until June 25th for the erection of a school building in the municipality of Surrey. F. G. Gamble, public works engineer; J. Barham, secertary school board, Clayton.

Smith's Falls, Ont.

This municipality is calling for tenders for $10,000 hospital debentures, 20-year, 5 per cent.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman, Board of Control, will be received until June 28th for the erection and completion of a new band stand in the Exhibition grounds. Plans, etc., at office of G. W. Gouinlock, architect.

Property Commissioner Harris has recommended the installation at the City Hall of the Canadian May-Otway protection fire alarm system at a cost of $2,000.

The Library Board has decided to erect a new wing to the College street branch. G. Locke, librarian.

Victoria, B.C.

The site for the high school has been selected at Spring Ridge and $30,000 contributed towards its erection by the trustees. Mr. Jay, chairman of the board; McNeill, Staneland and McIntosh, trustees.

Vancouver, B.C.

The accepted tender for the construction of a machinery hall was $11,885.

Tenders have been called for the clearing of land on military reserve, opposite Barnet, the site for the isolation hospital. Hermon & Burwell, surveyors.

Public tenders are requested for general excavation to new Congregation church, Thurlow street. Plans, etc., at office of the architects, Sharpe & Thompson, 536 Hastings street west.

Tenders were received for the new incinerator, as follows: Blackwell & Decarie, $65,000; Public Works Engineering Company, of Portland, four tenders on different types of plant ranging from $59,107 to $84,966; Dundon Excelsior Furnace Company, $69,000; Heenan Froude Company, who installed the present incinerator, $54,968, and $46,131 for varying types; Dickson Engineering Company, $49,500; J. E. W. Macfarlane, $82,357.

Woodstock, Ont.

The ratepayers will be asked to vote on an $85,000 city hall bylaw in July or August.

Winnipeg, Man.

The city council will call for competitive plans for a new city hall to cost $2,000,000.

The plans prepared by J. H. G. Russell, architect, Sylvester-Willson Building, for the new Westminster church, have been accepted. They call for an edifice of Gothic design with two towers and Sunday school in rear. Reported cost of two buildings, over $150,000. Plans for the Children's Hospital on Aberdeen avenue have also been prepared by Mr. Russell. Work on either will probably start during the present month. Noted previously.

A permit was [illegible] avenue fire hall [illegible].

The building of a Labor Temple is under consideration by union organizations of the city.

AWARDED.

Arnprior, Ont.

The contract for building addition to and making alterations in high school has been awarded to S. R. Kuhl, the lowest tenderer at $12,967.

Estevan, Sask.

The contract for the building of the school for the [illegible] school district was awarded to J. H. Wilson.

Hull, Que.

The contracts for the improvements to the St. Thomas School at Hull have been awarded to A. Archambault and Caron [illegible]. The former will install the heating apparatus for the sum of $900, whilst the latter will put in ventilators throughout the building and erect a fire escape for the sum of $2,300.

Montreal, Que.

The contract for the erection of a hall building for the Canadian Amusement Company, has been awarded to the J. Jacobs Company. Mr. J. Seath Smith, architects.

Messrs. Peden & McLaren, architects, have awarded contracts for the erection of Victoria church, Point St. Charles, as follows: Excavation and masonry work, J. Charette; plastering, R. D. Clarke & Sons; carpentering work, D. F. Deslaurieres; painting and glazing, John Allan; plumbing and heating, Dominion Camp Equipment Company; roofing, G. W. Reed & Company; wiring, E. A. Gregory; rolling doors, David McGill.

The contract for large concrete entrance way and stairs for the Chapel of the Immaculate Conception church, Rachel street, has been awarded to Messrs. Church, Ross & Company, concrete contractors.

The contract for reinforced floors, beams and fireproof partitions, Rosemount and William Dawson Schools, have been awarded to Church, Ross & Company. Mr. A. F. Dunlop, architect.

Contracts have been awarded as follows for the erection of seven cottages for the MacDonald College, Ste. Anne de Bellevue: Masonry and brick work, Robertson Bros.; carpentering work, Mr. Shaw; roofing, G. W. Reed & Company; wiring, Collyer & Brock; plastering, R. G. Hamilton; plumbing, M. Quicgley; painting, W. P. Scott.

Orillia, Ont.

The contract for the Carnegie Library was awarded to Joseph Langman, of Penetanguishene, the lowest. The only other whole tender was that of W. L .Bennet, Orillia, for $12,668.

Toronto, Ont.

Contracts were let for the erection this summer of a two roomed addition to St. Anne School, Bolton avenue, and also for an extension to St. Peter's School, Bathurst street, at an approximate cost of $9,000 each. Right Rev. Mgr. McCann, V.G., chairman.

Contracts for repairs, painting, etc., in connection with public schools were awarded as follows: For painting—Jarvis Street Collegiate Institute, T. Barrett, $205; Parkdale Collegiate Institute, F. Palmer, $128.40. Contracts were let in connection with the York Street School: Mason work, Self Bros., $10,225; carpenter work, E. Hollett, $5,670; roofing, G. M. Bryan, $325; plastering, T. Blackburn & Son,, $765; plumbing, Fred Armstrong Company, $1,175; painting, James Taylor, $1,025; structural steel, Reid & Brown, $393; steam heating, Keith & Fitzsimmons, $3,000; heat regulating, Johnston Temperature Regulating Company, $649. Other tenders accepted were for repairs on the following schools: Coleman School—mason work, Self Bros., $800; carpenter work, W. Williamson, $345; roofing, Flowers & St. Ledger, $55; painting, R. G. Johnston, $206. George Street School—Mason work, self Bros., $1,060; carpenter work, Frank Armstrong, $262; roofing, Flowers & St. Ledger, $65; painting, J. R. Robinson, $320. Painting contracts were awarded as follows: Annette Street—Gould & Malcolm, $280; balmy Beach, Jas. Casey, $150; Bolton Avenue, T. Barrett, $290; Carlton, Gould & Malcolm, $245; Church Street, Jas. Casey, $310; Clinton, T. Barrett, $90; Cottingham, F. J. Cox, $187; Deer Park, Taylor & Company, $109; Dewson, George S. Eagles, $130; Givens, Jas. Casey, $224; Alexander and Brock Avenues Schools, Wm. F. Palmer, $92.

Winnipeg, Man.

Alexander Wunsch has been awarded the contract for the erection of Evangelical Lutheran Church on Aberdeen avenue, at $11,000.

Residences

Brantford, Ont.

Building permits have been issued to James Shields, double brick dwelling on Colborne street, to cost $2,600.

Hamilton, Ont

Permits have been issued to Edward New, brick dwelling, on Sophia street, corner of King street, to cost $2,500. W. Theaker, brick dwelling on Garth street, between Aberdeen and Orchard Hill, cost $2,500.

Montreal, Que.

Tenders are now being received for erection of an apartment house on St. Mark street for Mrs. H. S. Phillips. Mr. Theo. Daoust, arcihtect.

Plans and specifications have been prepared and tenders were received until June 14th for the erection of an apartment house at the corner of Mance and Fairmount avenue for Mr. Emond. Mr. G. A. Monette, architect.

Owen Sound, Ont.

Plans and specifications are being prepared by Forster & Clark, architects, for a solid brick residence for Wm. McLaughlin.

Toronto, Ont.

It is stated that James Gibson, contractor, has purchased 380 feet frontage on Campbell avenue, on which about twenty brick houses will be erected.

Vancouver, B.C.

Permit was issued to Mr. E. M. Rinehart for an apartment house at 845 Smithe street, $12,000.

Victoria, B.C.

The building inspector has issued the following permits: Fred. Harper, dwelling on King's road, $2,700; Mrs. S. M. McDowell, dwelling on Blanchard street, $3,500; Dr. G. W. Hall, alterations to building opposite the court house, Langley street, $2,800; Thos. Brown, for a dwelling to be erected on Burleith street, cost $3,900.

Permits include two large residences, H. Bowen, on Rockland avenue, $20,000; J. A. Tracksell, on Foul Bay road, $10,000.

Winnipeg, Man.

Tenders addressed to W. Wallace Blair, architect, were called until June 15th for erection of apartment for Mr. H. Brownrigg.

A permit for the construction of a 3-storey apartment block on William avenue, was issued to Jos. Johnson, $40,000. P. M. Clemens, architect.

Herbert B. Rugh, architect, Union Bank Building, is receiving tenders for a house to be erected for Allan C. Ewart. The plans call for a cement-plaster structure of handsome design. Approximate cost $15,000.

Building permits include one for a new 3-storey apartment block on the northeast corner of Ellice avenue and Furby street. This is 66 feet by 89. Cost, $75,000.

AWARDED.

Fort William, Ont.

The contract was awarded to Cusson Bros. for the construction of D. McKellar's residence; cost $15,000.

Montreal, Que.

Messrs. Church, Ross & Company, have been awarded the contract for the reinforced concrete work, "Waldmere Apartments," St. Matthew street. Messrs. Wright & Son, architect.

Contract for the erection of a reinforced concrete garage for Mr. L. J. Forget at Senneville, Que., has been awarded to J. F. Jago & Company.

Contract for the electric wiring, residence for J. M. Wilson, Ontario avenue, has been awarded to M. Rubenstein. Saxe & Archibald, architects.

Contract for the completion of Mr. Russel's residence on Guy street, has been awarded to Mr. A. Trudeau, in succession to Mr. Thomas Wand. Saxe & Archibald, architects.

Business Buildings and Industrial Plants

Brantford, Ont.

The Cockshutt Plow Company will make extensions to the local plant this summer at an outlay of about $400,000. New warehouses will also be erected at Brandon, Saskatoon, Calgary, and the one at Regina will be enlarged.

Brandon, Man.

D. Beaubien, of this city, has offered $100,000 if the Methodist Conference will give $50,000, towards the establishment of a temperance hotel in Saskatchewan.

The Cockshutt Plow Company is asking for tenders for the construction of a fine warehouse, 80 x 80, three storeys, on the C. P. R. property at the foot of Sixth street. For further information apply to J. Inkster and D. Sheriff.

It is stated that tenders for the excavation for C. N. R. hotel, being too high, the company have put 75 men on the work.

Bows, Man.

The lumber mill of Calverley & Son was destroyed by fire on the 11th inst. Loss, about $10,000.

Bridgeburg, Ont.

The Canada Foundry Company recently purchased the shipyard of the Canada Shipbuilding Company and will convert it into a structural steel plant. Narcross Marble Company and the Monitor Harrow Company are seeking sites.

Berwick, Ont.

The cheese factory owned by Mr. Patterson was destroyed by fire recently. Total loss, about $4,000.

Cargill, Ont.

The power house, pump house, cooper shop and heading mill of H. Cargill & Son were entirely destroyed by fire on the 10th inst. The loss will run up into thousands of dollars. The firm will rebuild at once.

Chatham, N.B.

It is expected that J. H. Crandall, Moncton, will shortly erect a new saw mill at Morrisson's Cove, near here.

Calgary, Alta.

Tenders are being received until June 20 for the erection of a business block for Beveridge Bros., Judge Travis and G. J. Bryan. This does not include heating, electric wiring or elevators. Hodgson & Bates, architects, Grain Exchange, Calgary.

Danville, Que.

The plant of the Nicolet Falls Pulp & Lumber Works was damaged recently to the extent of about $5,000.

Fort William, Ont.

A. W. Frodsham & Company will complete the block on the corner of May and Myles street, by the erection of an addition. Cost, $15,000.

Goderich, Ont.

The town council have decided to erect a freight shed and waiting room.

Headingly, Man.

It is stated that the C. P. R. will erect a station at once on a site given to them by Messrs. McLaurin and McCallum.

Hamilton, Ont.

Thomas C. Watkins, Limited, represented by Thomas W. Watkins, purchased a block of property on the east side of John street, 100 feet front by 180 feet deep, on which the reorganized concern will build immediately an immense warehouse and stables.

Damage to about $2,000 was done to the tinning and galvanizing department of the E. T. Wright factory on Cathcart street on the 9th inst.

Lavina, Man.

The grain elevator was destroyed by fire on the 9th inst.

Moose Jaw, Sask.

The Gordon, Ironsides & Fares Company, Limited, meat packers, will locate their western plant here and commence work as soon as possible on the construction of their buildings.

Montreal, Que.

The building occupied by the Montreal Herald Publishing Company was destroyed by fire on the 13th inst. President, Jas. S. Brierley; F. Abraham, secretary-treasurer. It is understood that the building is owned by them.

Plans have been filed at Ottawa by Vickers, Sons & Maxim, of England, for a $2,500,000 shipbuilding and ship repair plant to be located in Montreal. The plans include dry dock, three large berths for the repairing and building of steel vessels, machine shops and plant capable of doing the heaviest construction and repair work, covering some fifty acres of ground. The plant will be located on the shore of the St. Lawrence, a little to the west of Longue Point, just at Molson's Creek. The site for the new shipyard will be prepared by the Montreal Harbor Commissioners, and about fifty acres of ground will be made by filling out from the shore. A dock will be built approximately [illegible] feet from the present shore line and parallel with it. A dry dock, 650 feet long by 135 feet wide, with a lifting capacity of 27,500 tons, will be located inside the main dock, and [illegible] a basin 1,000 feet long by 500 feet wide and 50 feet deep. In the rear of the dry dock basin there will be three construction and repair berths, with a length of [illegible] and a width of 60 feet each. An application has been made to the Government for a dock subsidy, and it is expected that this will be granted at the rate of three and a half per cent. for twenty-five years on $2,500,000. Plans have been filed by Lewis Brothers, Canadian agents for Vickers, Sons & Maxim, and it is stated Mr. Vickers will shortly arrive with the final plans.

Owen Sound, Ont.

E. O. Young is the architect in charge of the new foundry being erected by the Corbett Foundry & Machine Company, of Owen Sound. Noted previously.

Oshawa, Ont.

The McLaughlin Carriage & Auto Company will greatly extend their plant. It is stated that contracts have been let.

Port Alberni, B.C.

The Bank of Montreal, through Mr. C. Sweeney, manager in Vancouver, has purchased a building site here.

Portage la Prairie, Man.

Tenders were called until June 15th for the erection of offices for the Urban Mutual Fire Insurance. R. H. M. Pratt, manager; C. H. Mounsey, architect. Noted previously.

Proctor, B.C.

Tenders addressed to W. Wallace Blair, architect, Winnipeg, will be received until June 22nd for the erection and completion of an hotel building at Riverside, near here, for the C. P. R. Plans, etc., at offices of the architect, and also of the company at Nelson.

Peterborough, Ont.

G. Walter Green Company have bought the entire block in which their present plant is situated for future extension.

Sydney, N.S.

The Dominion Steel Company, it is stated, will locate a wire nail factory here or at Fort William. J. H. Plummer, president.

St. Marys, Ont.

Building operations in connection with a new cement company will be commenced shortly. The plant will have a capacity of 1,500 barrels a day.

Stratford, Ont.

A bylaw will be submitted to the ratepayers shortly to grant privileges to the Dufton Company, Limited, in return for which they will erect a two storey factory.

St. Thomas, Ont.

It is reported that a large steel plant may be established in this city for the manufacture of the Durbin Automatic Safety Car Coupler. J. L. Hendrick, L. Durbin and C. T. Hunn, all of Fort Scott, Kansas, and R. R. Powers, of Sarnia, Ont., are interested.

Toronto, Ont.

Tenders will be received until June 18th for the reinforced concrete structure of a 6-storey building on Yonge street for the Mason & Risch Piano Company. Bond & Smith, architects, 19 Wellington street west.

The Toronto Engraving Company has purchased a site on Richmond street west, where, it is stated, they will erect a fireproof building.

Tenders will be received until June 21st for mason work, roofing, plumbing and painting in connection with the new electric sub-station on Macpherson avenue. G. R. Geary, mayor. Plans, etc., at office of the city architect.

The Massey-Harris Company propose to build [illegible] houses for their employees near their factory. Estimated expenditure, $100,000.

Messrs. [illegible], Scott & Company have purchased property at 732 King street west where they will erect a warehouse.

Vancouver, B.C.

A building permit was issued for extensive alterations to basement of Thomson Bros. block, corner of Hastings and Abbott streets, $35,000; also for construction of steel frame, 5-storey block on Mount Pleasant, to Mr. H. O. Lee, for $100,000.

The B. C. Casket Company have notified the council of their intention to locate a plant on Burrard Inlet.

The National Paper Mills, Limited, head office, this city, will erect a large mill in this vicinity. C. J. Kay, manager; Sylvester Cropper, general superintendent, both of this city.

Victoria, B.C.

A permit has been issued for the additions to Empress Hotel, $125,000.

Permit was issued to G. T. P. for wharf buildings, $12,000.

Tenders were invited until June 14th for 2-storey brick buildings on Douglas street for the Drake Hardware Company; also for excavating, blasting and concrete for an office building for the Dominion Trust Company; also for a 3-storey brick building on Langley street for Messrs. Sweeney & McConnell. Plans, etc., for above at office of H. S. Griffith, architect, 100½ Government street.

Windsor, Ont.

It is stated that the Paterson Automobile Company, of Flint, Mich., will locate a Canadian branch here.

Winnipeg, Man.

Building permits were issued to Petrie Manufacturing Company for a 2-storey warehouse, Henry avenue, brick and stone, $22,000; also to Gallagher, Holman & La France, meat market, King street, two storeys, $20,000.

Applications from fifty different districts throughout Manitoba have been received up to the present by the Provincial Elevator Commission for the erection of grain elevators. The engineering department has been inaugurated, with E. P. Estier as chief engineer. He is engaged at present in drafting a new elevator system for Manitoba.

Permit was issued for interior finishing of the Fort Garry depot, $300,000; also to Dingle Bros. for warehouse on Stanley street, $25,000.

Yorkton, Sask.

The International Harvester Company has purchased a warehouse site on West Broadway on which they will erect a $70,000 five-storey building.

AWARDED.

Montreal, Que.

The general contract for alterations to property, corner Notre Dame street and St. Francois Xavier street, for Messrs. St. Cyr, Frigon and Gauthier, has been awarded to Mr. A. Mercure, contractor. Mr. Eugene Payette, architect.

The general contract for the alterations and repairs to the office building at 15 St. James street has been awarded to J. B. Gratton, Limited, contractors. Eugene Payette, architect.

The general contract for the erection of the H. Kellert & Sons building, corner St. Catherine and St. Urbain street, has been awarded to Messrs. [illegible] & [illegible], general contractors. [illegible] & Company's "Carrara" terra cotta will be used for the facings on this building. Messrs. Hutchison, Wood & Miller, architects.

(Continued on page 30)

Tenders and For Sale Department

Tenders for Dredging

Sealed tenders marked "Tenders for Dredging," will be received by the undersigned up to [illegible] p.m. JUNE 17TH for Dredging Little River Drain from the Grand Trunk Railway to the River Detroit.

Plans, specifications and all information may be obtained at the office of the undersigned. The lowest or any tender not necessarily accepted.

OWEN McKAY,
Township Engineer.

Walkerville, Ont., June 7, 1910. 24

Town of Wingham

To Contractors

Tenders, addressed to the undersigned, will be received up to 6 p.m., 21ST JUNE, for the construction of Sewers and Sewage Disposal Works for the Town of Wingham. Plans and specifications may be seen and forms of tender obtained at the office of the undersigned or at the office of the engineers, Davis & Johnston, Berlin.

Lowest or any tender not necessarily accepted.

JOHN F. GROVES,
24 Town Clerk.

County of Wellington

Bridge Tenders

Sealed tenders will be received by Jas. Beatty, County Clerk, Fergus, Ont,, until 2 p.m., on WEDNESDAY, JUNE 22ND for the construction of 9 reinforced concrete bridge and culverts, and for abutments, steel deck and concrete floor on the Moorefield bridge. For plans, specifications and other information, apply to the Reeves of Guelph, Pilkington, Arthur, Peel, Erin and Maryboro, or to the undersigned.

ALEX. STEWART, Living Springs,
Chairman County Roads.

J. M. YOUNG, Harriston,
County Roads Superintendent.

BOWMAN & CONNOR,
County Engineers,
24 [illegible] Toronto St., Toronto, and Berlin.

Tenders Wanted

Sealed tenders addressed to the Secretary, Department of Indian Affairs, Ottawa, and endorsed ''Tender for Oneida School-house,'' will be received up to noon of the 25TH OF JUNE, 1910, for the erection of a brick school-house on concrete foundation for the Oneida Indian Reserve, Ont.

Plans and specifications may be seen at the Post Office, St. Thomas, the Post Office, London, and the Office of the Indian Agent, Dela[illegible]

The successful tenderer will be required to furnish a bond in satisfactory sureties for a sum equal to the amount of the contract.

The lowest or any tender not necessarily accepted. The unauthorized insertion of this advertisement in any paper will not be paid for.

J. D. McLEAN,
Secretary.

Department of Indian Affairs,
Ottawa, May 27, 1910. 24

Notice to Contractors

Whole or separate tenders for the various trades required in the erection of a Municipal Building in the Town of Sudbury will be received by the undersigned up to 6 p.m., MONDAY, JUNE 27, 1910. Tenders to be accompanied by a marked cheque for 5 per cent. of the amount of the tender, made payable to L. O'Connor, Mayor, cheques to be returned to unsuccessful tenderers.

Lowest or any tender not necessarily accepted.

Plans, etc,, may be seen at the office of the architect, Jas. Thomson, 43 Victoria street, Toronto, or with George Elliott, Town Clerk, Sudbury.

L. O'CONNOR,
25 Mayor.

For Sale

Steam Shovel

One Style ''A'' Marion Steam Shovel, 1½ yard dipper capacity, about 45 tons working weight, in first-class condition, with new extra heavy reinforced boom, latest style new independent crowding engines, all thoroughly overhauled, the boiler just re-tubed. Can be inspected where it is now working. Offered subject to inspection and acceptance before shipment, and subject to prior disposition.

Apply

F. H. HOPKINS & CO.,
24 New Imperial Bank Bldg., Montreal.

City of Nanaimo

Sewerage Contract No. 1

Tenders will be received by the undersigned up to noon on FRIDAY, THE 24TH DAY OF JUNE, 1910, for the Excavation and Laying only, of Vitrified Sewer Pipes, with outfalls in harbour, and other incidental works of sewerage.

Tenders will not be considered unless made out on the forms supplied, and must be accompanied by an accepted cheque for a sum equal to five per cent. of the amount of tender with the envelope sealed and endorsed ''Sewerage'' Tender Contract No. 1.

Plans, specifications and general conditions may be seen and forms of tender obtained from the City Engineer's office.

The lowest or any tender not necessarily accepted.

ALLAN WATERS,
City Engineer.

Nanaimo, B.C., June 10th, 1910. 24

Village of Weston

Tenders for Sunday School

Tenders will be received up till JUNE 20TH for the construction of a building to be used as Sunday School and Church. Outside measurements 63 feet by 72 feet. Two storeys; semi-basement, including swimming bath, 12 x 35 feet, to be concrete. Main portion of the building to be brick, with artificial stone trimmings. Will receive tenders for whole of building, or on separate trades. Plans and specifications to be seen at office of

MOFFATT STOVE COMPANY,
24 Weston.

Don't Miss this Chance

About $2,000.00 worth of The Trussed Concrete Steel Company's Kahn Bar for sale.

Send for a specification. Inspect the goods and make me an offer.

J. ELLIOTT,
24 165 Queen St. East, Toronto.

Positions Vacant

Advertisements under this head ng two cents a word per insertion.

WANTED—TRAVELLING SALESMAN to represent firm manufacturing bank, office and store fittings. Must be competent to make sketches, etc. Man having experience in architect's office preferred. Apply, Box 974 ''Contract Record,'' Toronto. TF

Miscellaneous

Advertisements nnder this heading two cents a word per insertion.

PINE PILING—Can supply large quantities pine piling, any length up to, say, 70 feet, on cars C. N. O. R. Apply to A. Prentice, 649 Bathurst Street, 'Phone College 5729, or A. McPHERSON & COMPANY, Longford Mills, Ont.

FOR SALE.—84 pieces Lackawanna Steel Sheet Piling, 22 feet long, 12 inches wide, three-eighths thick, and one 8 foot x 8 inch Buffalo Forge Company Quick Running Engine, in good condition, immediate delivery here, boat or rail. —WM. LESSLIE, Walkerville, Ont. TF

Business Buildings and Industrial Plants

(Continued from page 20)

The contract for the reinforced concrete work, Dominion Oilcloth Building, has been awarded to Messrs. Church, Ross & Company. Messrs. Hutchison, Wood & Miller, architects.

Contracts have been awarded as follows for the alterations to the Kastel restaurant on St. Catherine street west: General contract, D. M. Long; steel work, Phoenix Bridge Company; plumbing and heating, Thos. O'Connell. Messrs. Finley & Spence, architects.

Messrs. Church, Ross & Company, concrete contractors, have been awarded the contract for all the concrete work in connection with the six storey factory building and dry kilns for the Dominion Oil Cloth Company on Parthenais street, designed by Messrs. Hutchison, Wood & Miller. The Dominion Bridge Company are erecting the steel work. The building will be of brick and concrete and fireproofed throughout.

Nelson, B. C.

John Burns, of the Nelson planing mills, was awarded the contract for the erection of warehouse for A. Macdonald, wholesale grocer, Winnipeg, Man.

Toronto, Ont.

The following contracts have been awarded in connection with Laundry Building, West Lodge avenue: Masonry and brickwork, Elgie & Page; carpentry, J. Bulger; structural iron and steel, McGregor & McIntyre; plumbing and heating, W. J. McGuire & Company; roofing and galvanized iron, Douglas Bros.; painting and glazing, T. G. O'Connor, J. M. Cowan, architect.

Vancouver, B.C.

The contract for the excavation work for Hotel Vancouver has been awarded to Messrs. Purdy & Henderson, of New York and Vancouver.

Power Plants, Electricity and Telephones

Calgary, Alta.

Plans are being prepared for a power plant here. Estimated expenditure, $80,000.

Dauphin, Man.

The $11,000 bylaw for electric light purposes was carried.

Ingersoll, Ont.

Mayor McKay, Reeve Fleet and Alderman Fleet have been authorized to take over and operate the plant and make the necessary changes to receive and distribute Niagara power. Noted previously.

Medicine Hat, Alta.

Preliminary reports are in on the electric light plant. Probable cost, $65,000. The city is considering moving the waterworks farther up the river in conjunction with the electric light plant.

New Michel, B.C.

Broley & Martin, the contractors in charge of the new waterworks system for this municipality, are making a deal with the New Michel Sawmill Company to put in an up-to-date electric lighting system.

New Westminster, B.C.

B. C. E. R. has purchased ten lots at the junction of the Eburne and Westminster-Vancouver line as a site for freight sheds.

Peterborough, Ont.

The Board of Works authorized W. Chipman, C.E., Toronto, to prepare plans, etc., for the new pumping station and sewers, and to have tenders advertised.

Quebec, Que.

Tenders addressed to Staveley & Stavely, architects, will be received until June 22nd for the following trades required in the enlargement of car barns at St. Malo, for the Quebec Railway, Light & Power Company: Excavation, masonry, plastering, carpentry, joiner's work, roofing; also for steel erection. Plans, etc., at office of the above.

Winnipeg, Man.

At a special meeting of the city council it was decided to purchase seventy-one feet of property on the west side of King street, some 200 feet distant from Notre Dame, for the erection of sub-distributing power station No. 1.

AWARDED.

Fort William, Ont.

Contracts for various supplies in connection with street railway material, were awarded as follows: Cull ties, J. C. Hunter, 21 cents each; cedar poles, J. C. Hunter, 15½ cents per foot; spikes, Fife Hardware Company, $2.47 per 100 lbs.; bolts, Northern Engineering & Supply Company, $3.60 per 100 lbs., f.o.b. West Fort; washers, R. S. Piper Company, $13.00 per 100 lbs., f.o.b. West Fort; gravel, Mount McKay & Kakabeka Railway Company, 65 cents per yard; weatherproof feeder wire, Canada General, $16.70 per 100 lbs.; copper trolley wire, Phillips Electric Company, $15.49 per 100 lbs.; steel rail bonds, United States Export Company, [illegible] cents, 37 cents and 63 cents each; rail joints, rail joint company, $1.53 each; steel rails, Algoma Steel Company, $32.50 per ton; strain insulators, Northern Electric, $27.50 per 100 lbs; 5-16 span wire, Northern Electric Company, $4.50 per 10 0lbs.; 3-8 span wire, Northern Electric Company, $4.30 per 100 lbs.; fork bolts, Northern Electric Company, $26.87 per 100 lbs.; cone hangers, Canada General, 54 cents each; single pullovers, Canada General, 67 cents each; double pullovers, Canada General, $1.10 each; clinch fars, Dawson & Company, $32.50 per 100 lbs. The engineer was authorized to order brass goods from next tenderer if present company cannot fill order as specified. G. A. Knowlton, chairman, Works Committee.

Regina, Sask.

The Francis Rural Telephone Company have awarded a contract for the construction of sixteen miles of telephone system to S. T. Ross, at the following prices:—Cross-arm, 66 a mile; bracket, $58.

Victoria, B.C.

The contract for the work of laying the conduits on Douglas street for the underground system of telephone wires will be let to the Electrical Construction Company, of Vancouver, for $3,900.

Miscellaneous

Medicine Hat, Alta.

Until June 20th, tenders are invited for $125,000 local improvement debentures. E. Roberts, secretary-treasurer.

Ottawa, Ont.

Tenders addressed to the Board of Control will be received until June 16th for supply of one hook and ladder truck; one hose waggon; one hose sleigh; two double sets of harness. John Henderson, city clerk.

It has been announced at the marine department that tenders for the ships of the Canadian navy will be called in September next. The admiralty is sending out plans and forms of specifications upon which the tenders will be based.

Recent building permits include: EdwardGaulin and Father Myrand, concrete dwelling, Anglesea square, $7,000; F. W. Burn, brick veneer dwelling, McLaren street, $6,000; A. Tracey, two brick veneer dwellings, Spruce street, $2,500 each; J. A. Des Rivieres, 1-storey, brick veneer and solid brick heating room, planing mill, Church street, $2,000; H. Hayley, brick veneer dwelling, Sweetland avenue, $4,000; Achille Fortier, brick veneer apartments, Besserer street, $7,000; W. D. Hopper, brick veneer dwelling, Oarling avenue, $4,000; Dr. R. P. Robinson, alterations and additions to apartments, Slater street, $9,000; Wm. Hunt, double brick veneer dwelling, Arlington avenue, $8,000; F. Diamond, brick veneer dwelling, Centre street, $3,000; Alex. Parker, three brick veneer dwellings, in row, Third avenue, $6,000; F. G .Allen, solid brick apartments, Somerset street, $7,000; J. More and W. D. Hooper, brick veneer dwelling, Chapel, $3,000.

Toronto, Ont .

Recent building permits include: H. H. Goode, Esq., 2½-storey brick dwelling, Whitney, $6,000; J. T. & W. Garton, 1 pair semi-detached 2-storey and attic brick dwellings, on 349-351 Sunnyside, $6,000; Toronto Plate Glass Importing Company, 1-storey corrugated iron shed, Don, $[illegible]; Canadian Rubber Company, 3-storey brick warehouse, near Yonge street, $[illegible]; W. A. Kennedy, 2 rows of 3 attic 2-storey brick dwellings, corner Shaw & Yarmouth, $10,000; J. J. Walsh, 2 detached 2½-storey brick dwellings, on Spencer avenue, $6,000; Miss M. Wallace, 1 pair semi-detached 2-storey and attic brick dwellings, on 405-7 Gerrard east, $5,500; Mrs. M. E. Coles, 2½ storey brick dwelling, on Deer Park crescent, $6,000; C. H. Dies, 4 detached 2-storey brick dwellings, Kenilworth, $9,200; G. B. Smith, 4 attached 2-storey roughcast dwellings, brick fronts, Deleware, $6,000; A. W. Moore, 2 detached 2½-storey brick dwellings, Fairview, $5,000; J. Wickett, 1 pair semi-detached 2½-storey brick dwellings on Danforth, $5,000; F. M. Tuckett, 3 pairs semi-detached 2-storey brick dwellings on Dundas, $12,000; R. A. Stapells, 2 detached 2½-storey brick dwellings on Farnham, $7,000; Jos. Bryant, 2 pairs semi-detached 2-storey brick dwellings on Deleware, $8,000; J. S. Case, 2 detached 2½-storey brick dwellings, on Westminster, $9,000; Butler Bros., 1 pair semi-detacher 2 storey brick stores and dwellings on College, $8,000; R. A. Baldwin, 2½-storey brick dwelling on Whitney, $5,500; Weismiller & McKenzie Bros., 8 2-storey and attic brick dwellings, near Sorauren, on Marion street, $24,000; Miss M. H. Brown, 2-storey brick dwelling on Wilcox, $6,000; W. O. McTaggart, 3 attached 3-storey brick stores and dwellings on Bloor, $12,000; Mrs. Hill, 2-storey brick stores and dwellings, Edward, $7,500; Barrett Bros., 1 pair semi-detached 2-storey brick dwellings, on Irene, $5,000; W. J. Brown, 4 detached 2-storey brick dwellings, Algonquin and Indian, $12,000.

Winnipeg, Man.

Tenders addressed to C. W. Sharp, Chairman Public Parks Board, will be received until June 20th, for erection, etc., of 2,500 lin. ft. wire fencing for Elmwood Park. J. H. Blackwood, secretary.

Recent building permits include: Dunn and Wallace, dwelling, Home street, $5,000; A. C. Galbraith, ten houses, east side Newman street, $25,000; P. N. Kellar, one house, Athol Main and Mac, $3,500; D. R. Williams, two dwellings, west side Greenwood place, $7,000; T. Ferguson, four dwellings, Bannerman avenue, $10,000; P. Wright, dwelling, Lenore street and Preston avenue, $3,500; Miss E. Spence, dwelling, west side Spence street, $4,000; F. W. Harvey, house, Bannerman, $3,000; J. Leslie, house, north side of Corydon avenue, $5,000; J. Christie, two houses, north side of College, between Charles and Aikins, $6,000; Mrs. C. Gerrie, $12,000 residence on Furby street, between Broadway and Preston; W. Stephenson, repairs and alteration to residence at 199 Kennedy street; E. H. Fleming, house, south side of Rosedale, between Helen and Lilac, $3,600; H. Bauer, terrace of store and dwelling, northwest corner Salter and Alfred, $4,500; R. D. Guy, dwelling, south side of Yale avenue, $5,000; L. Bell, dwelling, west side of Craig street, between Portage and Wolseley avenues, $2,500; T. Kelly, dwelling, north side Rosedale avenue, $2,500; Superior Fuel & Coal Company, east side of St. James street, coal briquette manufacturing company, three storeys, $10,000; Winnipeg Canoe Club, boat house, south end River Park, two storeys, 60 x 67, $5,250; Forseng and Monsom, dwelling, east side of [illegible], between Portage and Preston, $5,000; B. Skipworth, dwelling, west side Furby, between Buell and Ida, $6,600; P. Olson, dwelling, west side of Home, between Portage and Ellice, $[illegible]; [illegible] Wilson, two houses, east side Spence ,between Preston and river, $9,000; G. H. LaPlante, two houses, west side Arlington, between Preston and Buell, $6,500.

Economical Work in Masonry Contracts

Methods and Appliances Adopted on Record Construction—Stimulus Resulting from Publication of Individual Performances—Value of Carefully Devised Systems

From the following article relating to modern methods of bricklaying in England and America, published by the London "Builder," many of our Canadian contractors may find helpful suggestions:

During the erection of the British Westinghouse works at Trafford Park, Manchester, the daily number of bricks laid per man was increased from the average of 900 for the first month to the number of 2,250. The commencing figure was exactly double the trade union standard, and nearly three times the average attained by bricklayers employed by the London County Council. At the outset everything possible was done to ensure rapid work; the men were paid at a higher rate than that fixed by the trade union, they never had to wait for materials, the most modern labor-saving appliances were utilized, and the operations were under efficient supervision. Further improvements in the rate of laying were due to the weeding out of slow workers and the substantial inducements offered by the builders for the encouragement of rapid work.

Even the high record attained at Trafford Park was surpassed last year in the construction of six brick factory buildings at Chelsea, Mass., where by the employment of special methods the daily average of 2,600 bricks per man was reached, while individual records of 3,000 bricks were made from time to time.

Methods and Appliances Adopted

As all of our readers are interested—some directly and others indirectly—in economical construction, we give a brief account of the methods and appliances adopted by the contractors for the buildings mentioned.

All bricks, including those for facing and ordinary work, were brought upon the site in railway trucks by way of a short siding. Owing to the circumstance that only three trucks could be accommodated at a time, it was found best to put a good staff of men on the work of unloading. The number of bricks handled by each man was carefully noted, and the figures were recorded on diagrams affixed to the outer wall of the contractor's office. As a result of this system the men soon began to take pride in their scores, and the spirit of competition thus engendered had the effect of facilitating operations to a noteworthy extent.

In place of ordinary hods, racks of special form were used, which consisted of cheaply made frames each holding 18 bricks in two tiers.

Bricks arriving by rail were sorted by the unloading gangs and stacked on racks, and these in turn were loaded upon special two-wheeled barrows designed for carrying twelve filled racks, or 216 bricks in all. For supplying the men working on two of the buildings the racks were delivered direct to lifts, whence the bricks were distributed by means of wheelbarrows at the required elevation. The other four buildings were supplied with bricks on barrows loaded up in storage sheds.

To avoid unnecessary labor in the transfer of material from the trucks to the storage sheds or the elevators, a simple form of gravity conveyor was used, consisting of steel rollers working in ball bearings carried by a light steel frame.

The number of bricks per rack was settled by practical experiments, which proved that the weight of about 90 pounds could be handled more economically than any other. Every effort was made to save the wasteful expenditure of skilled labor. With this aim the bricks were not only sorted into two classes, but chipped and damaged specimens were rejected, and all bricks were placed on the racks with the plane face of each brick towards one end of the rack distinguished by a coat of black paint.

Stacks of bricks on racks were disposed close to each bricklayer. At first it was thought that the most convenient arrangement would be to place the racks parallel to the wall, but experience soon demonstrated the point that the bricks could be picked up more readily with the racks perpendicular to the wall. With two piles of bricks, facing and ordinary, close to his hand, and a trough of mortar equally near, the bricklayer had every opportunity of executing work without waste of time.

The mortar troughs were spaced 3 feet apart along the wall, and close alongside were the stacks of bricks, the arrangement being such that mortar was trowelled up with the right hand, and bricks were picked up with the left hand. It is stated that the bricklayers were not entirely satisfied with the spacing, but actual records of work accomplished speedily convinced them. So thoroughly did the contractors carry out the system that the arrangement of materials was reversed for left-handed bricklayers, and the results proved remunerative. After various experiments the mortar troughs were mounted at a given height above the staging so as to obviate stooping, and practical tests also showed that the best spacing of bricks and mortar was 19 inches from the wall.

System means Rapid Execution

Comparing the carefully-devised system briefly outlined above with the haphazard methods followed by the average building contractor, we have a very clear indication of one reason for the rapid execution of brickwork in the United States.

It is obvious, however, that the most scientific organization must fail in securing its intended object unless backed up by the willing support of those upon whom its application depends. In the case of the buildings now in question, the interest of the workmen was excited and sustained by counting and publicly recording the number of bricks laid per hour by every man. The necessary rule requiring that a wall shall be carried up course by course along its entire length, usually encourages slow work by men who can lay a specified number of bricks faster than some of their fellows. It was found that the system of counting bricks laid got rid at once of all tendency to loiter. Rapid workers seemed anxious that their records should not be spoiled by neighboring laggards, and having completed a course for their section of the wall they were only too pleased to empty the racks remaining by laying bricks on the right or left hand section where operations were behindhand.

In addition to the emulation fostered by the publication of individual records, further rivalry was established by providing flags of different sizes from 5 inches by 8 inches up to 5 feet by 8 feet, and permitting the largest flag to be flown by the foreman whose gang had laid the largest number of bricks on the preceding day. Miniature flags representing those on the various buildings were placed daily on the diagrams attached to the office wall.

The local labor unions at St. John, N.B., have organized a building trades council, of which Mr. J. S. Brown is the chairman.

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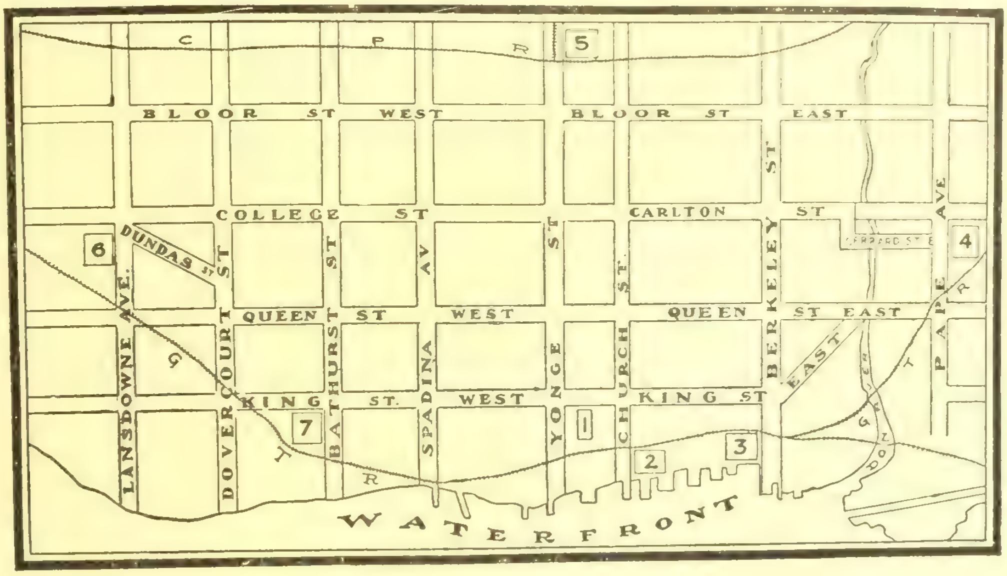

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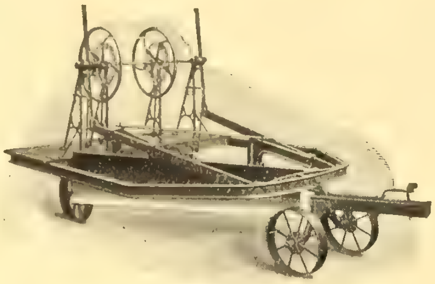

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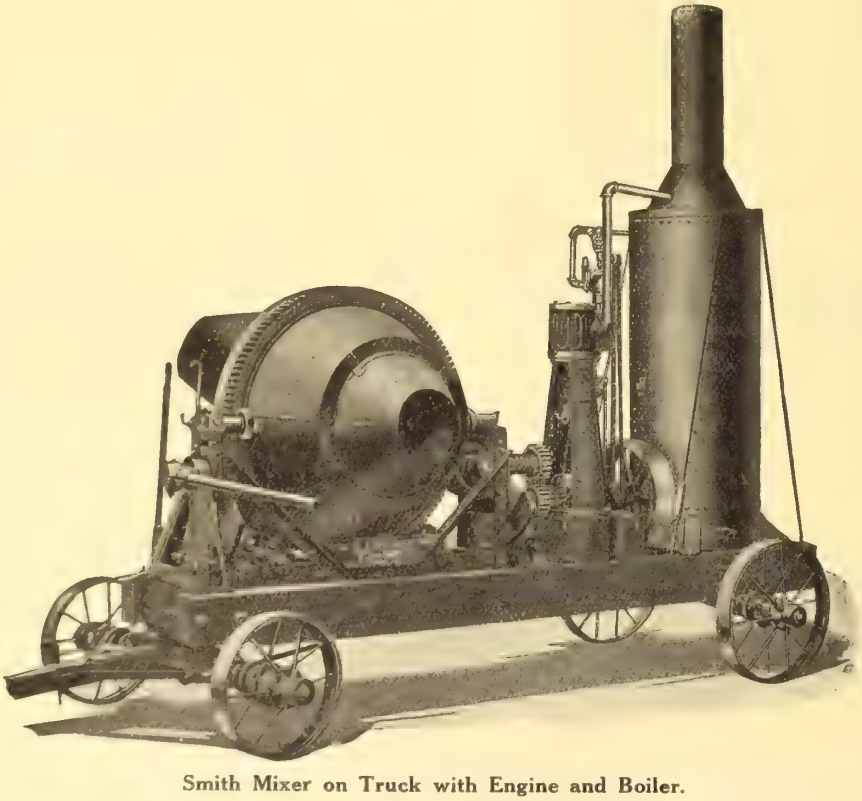

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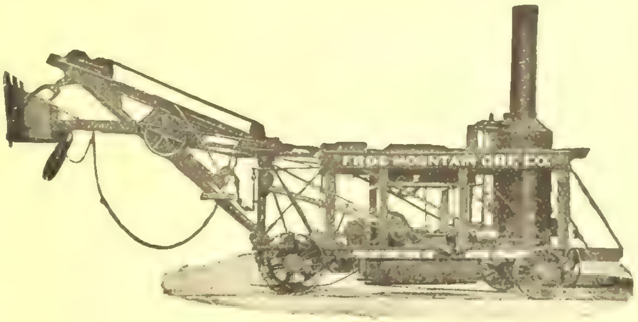

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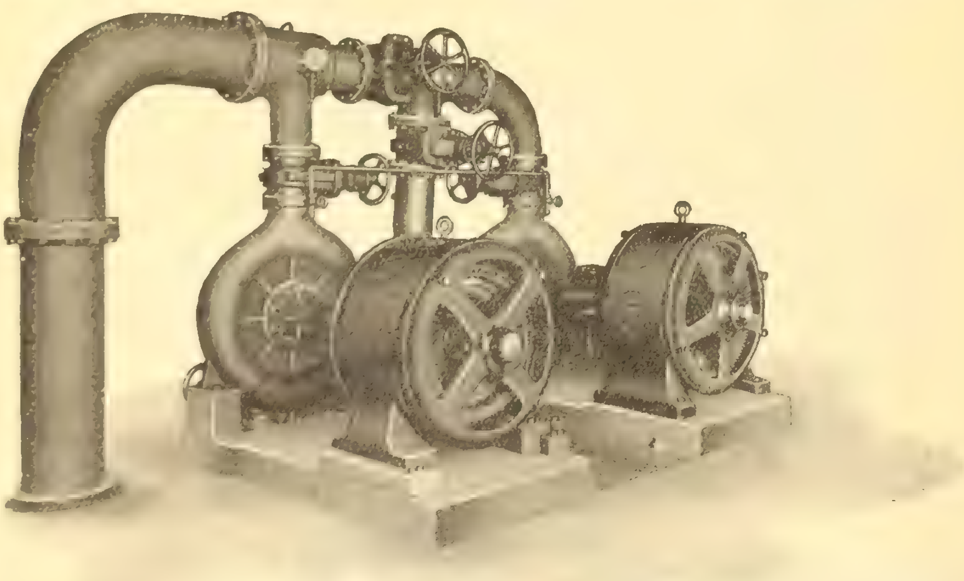

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ESTABLISHED 1886

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Vol. 24 Toronto June 15, 1910 No. 24

Bids Should be more Uniform

When the prices for which work is being let in this country to-day are considered, it is sometimes perplexing to attempt to fathom from what source the estimators have received their data. This in some cases must have been very inexact, for one not infrequently sees tenders for a particular job the prices for which vary as much as one hundred per cent. It is evident that the system of estimating must work in very different ways according to the opinion of the estimators.

Now the basis for estimating should exist in addition to a well-tested cost system and thorough knowledge of the materials and quantities required. It is not, of course, the custom for the engineer to place before the contractor the result of his careful calculation as to the cost of the work. Were this to be the general custom, the contractor would be better informed as to what was required of him and the engineer would receive more uniform prices on the work to be done. It is just as necessary for the contractor to have a basis upon which to build his estimate as it is to have material with which to construct. This basis the engineer should furnish, and there are those who consider it unfortunate that the lump sum tender has become so common. It must be admitted that many conditions exist in which this form of tender is most suited, but in large works this has been forced to an absurdity, and as a result most of the estimating is mere guesswork. In many cases it is asking too much of the tenderers to spend large sums of money in securing information upon which to bid, having in mind the fact that their chances of securing the contracts is possibly but one in twenty. It is obvious that the contractor and engineer's client would both be more fairly treated if it were the custom among engineers to prepare in detail an estimate of the quantities of material, so that whether the work is let by unit prices or lump sum, the contractor would not be required to spend much time in preparing his tender. In this way he would figure more closely and with much greater assurance. Doubtless this would place greater responsibility upon the engineer, requiring him to be more exact in his work, but it would make it possible for him to secure better returns for that work.

Should Cement be Sold by Weight?

At a recent meeting of the American Society of Engineering Contractors, the custom of selling cement by weight came in for a good deal of criticism. A particular source of trouble, it was contended, is the fact that while cement is bought and sold by weight, its proportion to other ingredients with which it is mixed in construction work is figured according to volume. The added facts, that weight and volume do not always bear the same ratio to each other, and that there is a considerable difference between the volume loosely packed and the same weight of cement when closely packed, tend only to aggravate the case. The society closed the discussion by passing the following resolution:

> That it is the sense of this meeting that the American Society of Engineering Contractors adopt, and advocate for general use, as a standard bag of cement, one weighing 94 pounds, and that this be considered the equivalent of one cubic foot.

The crop reports from the various sections of the country are on the whole most favorable. Grain is doing well all through the west, despite the fact that the recent cold spells somewhat retarded growth. The farmers expect to make new records in 1910. There is plenty of moisture in the ground and the grain is from five to seven inches high. From New Brunswick comes a statement that while May was a cold month and vegetation was consequently slow, the season in that province was favorable for seeding and the acreage put in crop quite up to the average.

Some little time ago the city council at Victoria, B.C., decided that a "Granitoid" pavement, for which an American concern has a Canadian patent, if laid by any other name, would wear as well. The American concern, to wit, the Bloom Paving Company, of Chicago, did not deny the truth of this assertion but resented the infringement of their patent. They are now contemplating a law suit against the city with a view to showing the illuminating effect of good deeds in a naughty world.

The Carpenters' and Joiners' Union at Toronto have decided to affiliate with the Trades and Labor Congress of Canada. At present they are only affiliated with the American Federation of Labor.

Equipment of Fire-fighting Waterworks

Installation and Cost of the Fire Service Water Supply System at Winnipeg, Man.—Results of a Working Test of the Plant*

By H. N. Ruttan, City Engineer, Winnipeg.

In the year 1905, the city of Winnipeg was subject to very excessive fire insurance charges, due largely to the fact that the development of the waterworks system had not kept pace with the extraordinary growth of the city. As a means of relief the city council had a thorough investigation made.

Committees of the council, with the city engineer, made several visits to the principal cities in Canada and the United States, where special systems were in use, and after a careful consideration, determined that the gas engine pumping plant offered, for the conditions of Winnipeg, the most economical and satisfactory solution of the problem of fire protection.

It was essential, from the fire underwriter's point of view, that any plant adopted should be provided with two independent sources of power. Electricity would have been an ideal power, if the above condition could have been fulfilled. Steam was, on account of the heavy standby losses, out of the question

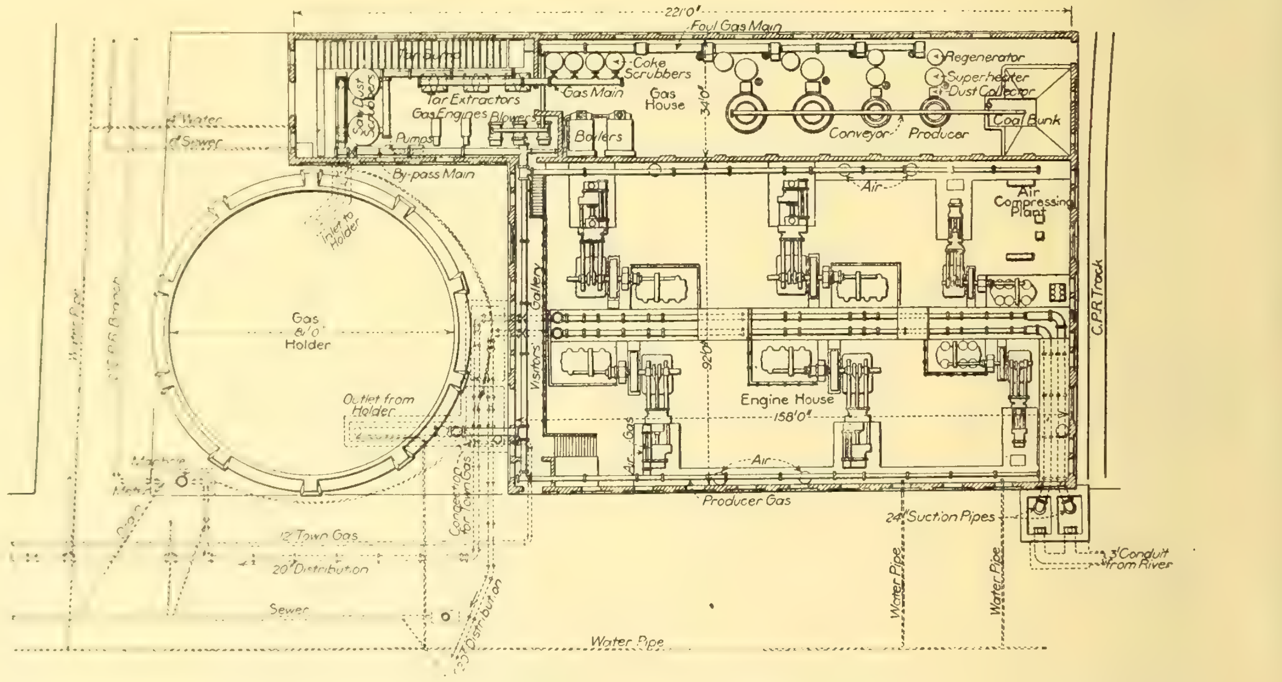
Steam and electricity being out of the question, gas power, filling all the requirements, was finally adopted. For alternative sources of power, there are available, producer gas and city gas, in addition to a large reserve of producer gas in the holder. Standby losses in fuel in this system are practically nothing.

The first of the pumping units was placed in service in November, 1907, and has been available for fire protection since that time. The remaining units were completed, and placed in service between that time and July, 1908, when the whole plant was practically completed, and its operation taken over by the city.

The distribution is made by eight miles of mains from 10 to 20 inches in diameter, and 85 fire hydrants. It covers the central, closely built, busines ssection of the city.

Pumping Station

The pumping station is situated on the bank of the Red river and contains the following equipment: 4 Crossley, 2-cylinder tandem gas engines of 540 h.p. each; 2 Crossley, 2-cylinder tandem gas engines of 250 h.p. each; air compressing starting plant in duplicate; 1 producer gas main supplying all engines; 1 city gas main, in reserve, supplying all engines. The engines above described drive six triplex double acting pumps. The pumps are furnished with suction and discharge mains, 20 inches in diameter, in duplicate, all pumps being connected with both mains, either main being of sufficient capacity for the whole plant. The pumps take their water from a well, which is divided into two compartments, either of which will supply the whole plant. The water is conducted to the well by an intake pipe three feet in diameter, which extends for a distance of 425 feet from the well to the deep water in the river, where it ends in a stone ballasted crib.



Producing Gas Pumping Station for Fire Protection, Winnipeg, Man.

Producer Gas System

The producer-gas system consists of four Crossley producers, two of 500 h.p. and two of 1,000 h.p. each, an elevator and conveyor for handling coal, two air superheaters, hot-gas boilers for each unit, four wet scrubbers, three centrifugal tar extractors, two sawdust scrubbers, centrifugal circulating pumps and Root air blowers. The cleaning plant is operated by two 18 h.p. Crossley gas engines, either of which is of sufficient capacity to drive the whole plant.

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*Extracted for this journal from a paper read before the American Waterworks Association, April 30th, 1910.

An important feature of the installation is that there is a spare unit of each type of machine, so that in case of a breakdown, the plant can still be operated to its rated capacity. Two steam boilers, of about 50 h.p. each, furnish what additional steam is required for the producer, and also drive the elevator and blowing engines, and supply steam for heating the buildings.

The gas holders and pumping station are connected with the city gas mains by a special 12-inch pipe. If, for any reason, the producer-gas system should be out of service, a full supply of city gas may be at once conducted to the holder or directly to the engines by a special main provided in the pumping station for that purpose. A gas holder of 250,000 cubic feet capacity stores a reserve of gas, either producer or city gas, sufficient to operate the whole plant for from one and one-half to five hours. This will give ample time to fire additional producers, or to make provision for the use of the city gas, in case of a long-continued fire. It is not likely that more than half the capacity of the plant will be required except in extraordinary cases.

Distribution System

Two 20-inch mains lead from the pumping station to Main street by different routes, connection with submains on the way. Either of these mains, in case of accident to the other, is sufficient to take the water from the pumps when working at their rated capacity. The mains are designed to withstand the ordinary working pressure of 300 pounds per square inch and water hammer. They were tested to 700 pounds per square inch at the foundry, and after being laid, were tested to from 500 to 700 pounds. The pipes were provided with extra heavy hubs and two lead grooves. These joints have given entire satisfaction.

The hydrants are connected to the mains by 8-inch flanged pieces. They are provided with 4½-inch hose nozzles with independent gates. These nozzles are, when required, reduced to 3½ and 2½ inches by suitable reducers, 3½ inches being the largest hose now used.

The hydrant valve is 8 inches in diameter, and is provided with 1-inch pilot valve to fill the hydrant before opening the main valve against the pressure. Both the valves are operated by the same stem. Each hydrant connection is provided with a gate valve so that the hydrant may be cut out from the system in case of necessity.

With bituminous coal of 14,000 b.t.u. per pound the contractors guaranteed to deliver 75 per cent. of the heat value of the coal to the engines. Two tests of the producer plant were made, as follows:

Efficiency Test, Producer Plant

Bituminous slack coal and coke used in test b.t.u. per pound	11,442
Guarantee 75 per cent. of above	8,582
Seventy-five per cent. of total b.t.u. in coal ..	226,616,292
Less surplus in holder	625,806
Guarantee	225,990,486
Delivered for use in engines computed on basis of individual tests	199,865,238
Deficiency amounting to 11 per cent....	26,125,248

This may be partly accounted for Mr. Ruttan says by (1) want of economy in firing boilers; (2) leakage from holder, which was allowed to blow of between 4 and 5.30 p.m., resulting in a considerable loss of gas; (3) the coal used was not up to the specifications as regards heat value as shown above. It was also of poor quality, on account of the large proportion of dust which it contained.

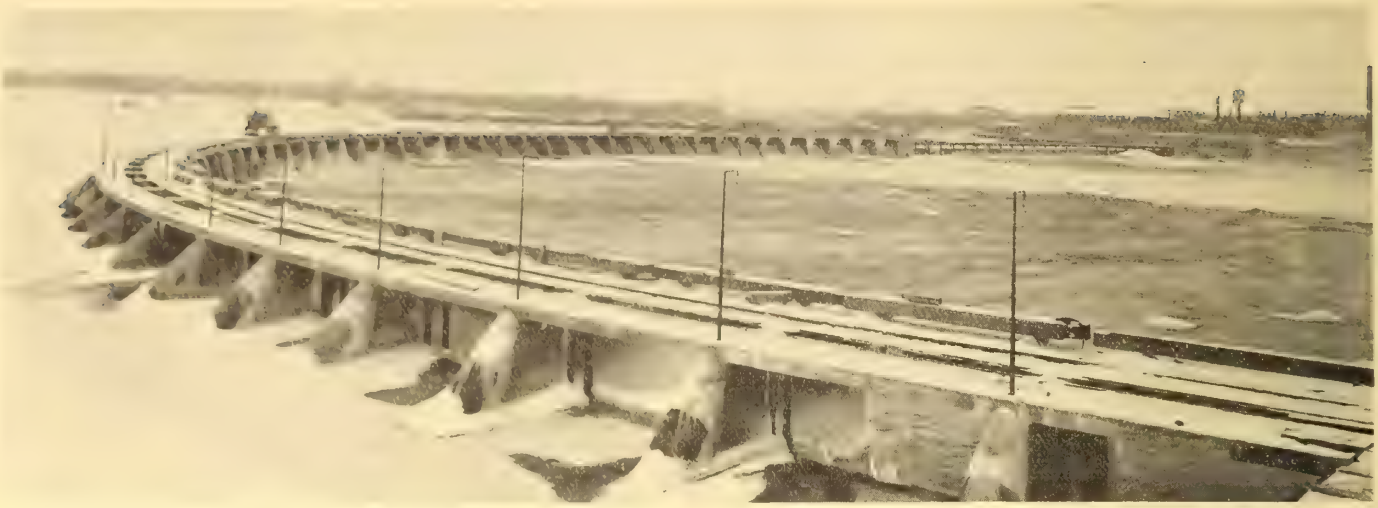
Working Test—The plant was run from 9.45 a.m. to 5.45 p.m. From 8.30 to 2.30 producers Nos. 1, 2 and 3 were operated with air-inlet valves half open, the pressure on the air main being 22 inches of water. At 2.30 o'clock the gas holder had risen 9 feet. At this time No. 1 producer was cut out, and air valves to Nos. 2 and 3 were opened to full extent, air blast being increased to 25½ inches of water. At 2.30 the calorific value of the gas in the holder was 170.74 b.t.u. per cubic foot. At 3.30 the holder had lowered 1 foot 3 inches, and the calorific value of the gas was 162.13 b.t.u. per cubic foot. The holder was maintained at this level until 4.30 o'clock, the calorific value of the gas at this time being 167.73 b.t.u. per cubic foot. Between 4.30 and 4.45 there was a rise of 9 inches in the holder. Between 4.45 and 5.30 the holder fell 1 foot 6 inches. Ashes were taken from the producers at this stage, and in the final 15 minutes of the test there was a slight rise in the holder. The whole plant was operated during this test at a pressure of 300 pounds per square inch.

Detailed Cost of Work

The buildings, intake, foundations, and distribution system, were constructed by the city, by day labor, and the cost of the several branches of the work were as follows:

Land			$ 58,549.80
Buildings: Comprising about 840,000 bricks, 7,500 cubic yards concrete, 15,000 cubic yards excavation, 132 tons structural steel, roofing, millwork, cranes, heating, etc.			179,144.11
Intake from river and well; Excavation, 3,500 cubic yards; concrete, 600 cubic yards; wooden conduit, 425 feet			28,912.80
Machinery, including gas producer plant			396,003.47
Distribution System:—			
8-in. pipe, 285 feet......	$ 3.00	$ 855.00	
10-in. pipe, 18,261 feet......	3.47	63,366.71	
12-in. pipe, 16,290 feet......	4.50	73,307.25	
20-in. pipe, 3,196 feet......	9.20	29,403.20	
8-in. flgd.. 1,390 feet......	8.70	12,093.00	
Asphalt, 13,414 feet......	1.30	17,438.46	
Hydrants 79............	200.00	15,800.00	
8-in. valves, 79............	33.00	2,607.00	
10-in. valves, 41............	45.00	1,845.00	
12-in. valves, 26............	68.00	1,768.00	
20-in. valves, 4............	180.00	720.00	
Miscellaneous	......	6,851.92	
			226,055.54
Miscellaneous:—			
Preliminary expenses		$3,003.57	
Printing, etc.		1,405.55	
Tools and plant		325.03	
Spur track		84.48	
Emergency gas main		4,318.71	
Contingencies		1,174.02	
			10,311.36
			$898,977.08
Engineering and interest, estimated			44,948.00
Total....................................			$943,925.08

During the months of April and May of this year the building permits issued at Moose Jaw, Sask., totalled $183,250 and $207,000, while for the five months the permits represented a value of $420,000, compared with an aggregate of $194,000 for the first five months of 1910.



Chaudiere Dam upon Completion—The Steel Nosings, shown here, are an interesting feature.

Construction of the Great Chaudiere Dam

Brief Particulars of the Design—Methods and Special Features of the Work — Noteworthy Success of Steel Concrete Construction

By A. Hector Dion.

The Chaudiere dam, which has been in operation for some eleven months, and that has admirably fulfilled the purpose for which it was constructed, is one of the most striking applications of steel concrete applied to hydraulic purposes; its suitability and eminence over other forms becoming more and more apparent every day. The dam consists of 49 piers and 2 abutments placed radially to the arc of a circle having a radius of 566.33 feet, the length of arc being 1,300.189 feet. These piers are built up from solid Trenton bed rock to a height of 22 feet. They are connected by bridge floor slabs 15 inches thick, heavily reinforced.

The general dimensions of the piers are as follows: Length, 39 feet 5 inches at base, 23 feet 5½ inches at bridge floor; width, nose upstream at 4 feet, tail downstream 2 feet.

The plan of pier presents a modified ellipse—this being the section creating least obstruction to flowing water. In designing the pier a water pressure of 100 tons and an ice pressure of 200 tons was used. The principal reinforcing used in piers consisted in long steel rods, 1¼-inch at 6-inch centres and ¾-inch diameter at 9-inch centres, bent into the shape of a hairpin. These had their ends upset and threaded to take a nut. These hairpins were bolted in a vertical position to 4-inch channels, which run the whole length of pier. These channels were, in turn, securely bolted to the rock by means of rock bolts. Outside of these, and wired to them, are ⅜-inch steel rods, running horizontally, spaced at 16-inch centres. ¾-inch rods run parallel to the upstream and downstream ends of pier. These do not extend to the anchorage. A ½-inch steel plate nosing, plainly shown in picture, completes the pier. This nosing was to take care of the grinding and wear caused by ice shoves and logs.

The bridge slab, which is 23 feet 5½ inches wide and 15 inches deep, is securely tied in to piers by ⅜-inch round steel rods bent to suit angle. This floor slab is reinforced with ¾-inch round steel rods at 6-inch centres at bottom and ½-inch round steel rods, 6-inch centres at top. These are fastened together by U-shaped stirrups made of ¼-inch rods at right angles to the above rods. Cross rods were placed, these of ¼-inch round steel and at 14-inch centres. Double stop-log checks are

Rock Anchorage and Pier Nearly Complete.

Showing Stop Log Post and Hair Pin Reinforcement placed in each pier; these are built up from 8-12-inch channels.

In the construction of this dam very little cofferdamming had to be resorted to, for at that time the water in the Ottawa river was at a very low level—a four-foot cofferdam sufficed. After the cofferdams were completed, the rock was barred and stripped off and the exact position of each pier located by transit checking back several times. This being done, rock bolt holes were drilled, and channel foundations put in, then hairpins erected in place, stop-log gains and nosings placed, the forms were put in. Steel nosings were placed to act as part of the forms.

One mixer was placed first at the Quebec end of dam and a travelling derrick mounted upon a track running at downstream side of dam. A Smith mixer was used. This dumped into buckets, which were hauled to derrick, which lifted them and deposited their contents into the forms. As each pier was completed, the derrick moved on. Sixteen piers were done from this end. Two mixers were used on the Ontario side and 33 piers were finished by the same method as above. A mixture of 1 : 3 : 6 was used in all foundations. For everything above the foundations a mixture of 1 : 2 : 4 was used.

Fissures or cracks were present in the rock above the piers, so it was decided to put in a cut-off trench. This was done wherever there was any indication of cracks. In these a mixture of 1 : 3 : 6 was used.

Method of Handling Concrete by means of Travelling Derrick

The engineers who had the construction of the power dam in charge were Wm. Kennedy, Jr., Montreal, for the Quebec power owners, and John B. McRae, Ottawa, for the Ontario companies.

Methods of Reinforcing Macadam Roads

By E. M. Vail

The method giving the best general satisfaction is to sweep the loose dirt from the stone bed to the shoulders, scarify or break up the surface of the upper course of stone, then spread and shape the old material to form a proper crown of the same curvature as the surface of the finished road, using a little new material where necessary.

Old roads are usually worn more in the centre than at the edges of the stone bed; hence when the loosened stone is raked toward the centre to form a crown, a shoulder of dirt is formed for the new stone which is to be added later. The shoulders are then cleaned and shaped for their entire width, the gutters properly attended to and the shrubbery and overhanging limbs of trees trimmed to at least twelve feet above the road at all points. It is especially necessary that this work be done in advance of the spreading of the new stone, so that the new work may be kept clear of dust and dirt of all kinds.

The roadway, having been thus prepared, is ready to receive whatever kind of resurfacing the specifications call for. One method is to spread a cushion of clean, sharp sand, followed by new, clean 1½-inch stone, cubical wooden blocks being used to ensure a uniform width. After rolling once, hot asphaltum binder is applied, followed by a light coat of clean ¾-inch stone, enough to keep the roller from picking up the stone. This first application of binder and ¾-inch stone is sometimes followed by another applied in the same manner.

In cases where the old material is properly rolled and shaped, as explained above, no depressions or irregularities appear in the new work, but the 1½-inch stone shows on the surface with just enough ¾-inch stone and asphaltum oil to fill the voids and bind the whole together.

It is frequently necessary to take up an excess of binder appearing on the surface by spreading a light layer of ¾-inch stone and screenings, carefully broadcasting it with shovels where needed. If sand is used to fill a part of the voids between the stones, it is very important that it be shaken down out of sight before the asphaltum binder is applied or the binder will not adhere to the stones.

Uniformity of Courses

Some local engineers and supervisors do not yet realize the importance of having each course of stone uniform in size and the same depth in all parts, and therefore allow the contractor to dump the new stone on the hard, dusty surface of the old road where it will not properly bind.

If the loose dirt has not been swept away or scarified and rattled down among the old stone by rolling, it mingles with the new stone and prevents the asphaltum binder from adhering.

The additional stone necessary to build up a crown on an old flat surface costs more than scarifying and reshaping, because the depth of the new stone varies, perhaps, from 1 to 6 inches.

The amount of asphaltum binder required varies according to the depth of loose stone to be treated. When too little is applied, dust will soon work in and render it impossible to properly bind the stone even with an additional amount of binder. An excess of binder will result in soft, spongy spots, from which melted asphalt will ooze on a hot day. It will therefore be readily seen that in a section varying from 1 to 6 inches in depth it is almost impossible to determine the amount of binder required. In some cases only enough extra dirt is borrowed from the side of the road to form a narrow shoulder for the new stone instead of reshaping the entire shoulder to the gutter line as suggested. This causes an abrupt drop from the edge of the stone, which is liable to upset a vehicle.

The process just described is what is known as the penetration method, and gives very good results when exactly the proper material is obtained, heated and carefully applied in the right quantity. On account of the extreme care necessary from start to finish with the penetration method, it has been thought advisable on some of the more important roads to adopt the mixing method, even after considering the additional first cost.

The Mixing Method

For the mixing method the foundation and shoulders or box, as it is commonly called, is formed in exactly the same manner as in penetration. [illegible]

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* Assistant State Supervisor of Public Roads, New Jersey.

mixture is then spread, cubical wooden blocks being used to aid in getting a uniform thickness before rolling, for when the roller has passed once over it, the material has set firmly together and it is difficult to fill up any slight depressions or roll down bumps.

This first course is followed by a thin second course of small stone coated in the same way, which is intended to fill up any spaces between the coarse stone and make a water-tight road. In some processes even a third coat, consisting of treated stone dust, is lightly scattered or broomed on to make a finished surface.

Since most of the work to be performed, with money apportioned the various counties from the motor vehicle fund, will be by contract, it will be necessary for contractors who would successfully compete for this work, and, in fact, all state aid work, to provide themselves not only with standard 10-ton rollers, the regular wide-tired wagons and small tools, but a scarifier and a suitable outfit for asphaltum work. One roller and one scarifier have occasionally been made to do the work for two or three small jobs located in the same district. While we should encourage small contractors in every possible way, it is not fair to county or state to put up with the annoyances and delays consequent upon such work, and every contractor is now expected to set apart a full set of tools for each particular job contracted for.

Effect of Sewage Gases on Concrete Work

Reliable Investigations and their Results—Disintegration Caused by Sulphur Compounds—Conditions Most Injurious to Portland Cement Concrete*

By Wm. Dunn, F. R. I. B. A.

The subject of the present communication, the author stated, was one in regard to which it might be assumed that the available evidence was either inconclusive or of a more or less negative character. For, notwithstanding that cases were on record of destructive changes in tanks and sewers, the opinion tended to prevail that when the concrete construction was sound no marked disintegration need be anticipated, neither from sewage nor from its emanations.

The author's experience, however, did not support this view, and it was to the elaboration of this, the positive side of the question, that he desired to direct attention. During the last five or six years he had had very special opportunities for studying the problem.

The concrete was composed of one part of Portland cement properly mixed with clean water and six parts of ballast thoroughly free from loam, clay, mud, or dirt of any kind, and no material was allowed to be used larger than would pass through a 2-inch screen.

Along the sewage inlet channel it was observed that the greatest disintegration had taken place on the walls at the liquid level. Owing to variations in the flow of the sewage, the level of the liquid in the tank and channels rose and fell; thus a certain area of the walls was constantly being immersed in the sewage and then exposed to the air. This area was, consequently, even when not immersed, much wetter than the part of the walls which was always above the level of the liquid. The latter area at this point showed erosion, which, however, had not penetrated so deeply as that at the level of the liquid itself. At the liquid level there was a deep groove in the concrete, and above this the face of the work had bulged out and lost its nature.

The first portion of the hydrolytic tank appeared to have suffered very little. The walls and roof had only the slight sulphur deposit. At the liquid level, which varied less than in the channel, there was a slight erosion. The second part of the tank, i.e., the hydrolysing chambers, was found to have suffered in places to a marked degree. It was observed on breaking through the erosion on the surface that the concrete at the back was moist, soft and gritty. Also, it was noticed that increased dampness constituted an important factor in the destruction of the concrete, for the lower parts of the vertical faces of the beams supporting the roof were more affected than the upper parts. The lower portions of the vertical walls of the tank also were more eroded than the upper. At the liquid level the concrete had been severely attacked, and a deep groove existed in it.

The point indicated by analyses was the conversion of the lime in the cement into sulphate of lime, the sulphur being obtained from the sewage flowing through the tank and channels, as well as from the gases expelled from the sewage, and contained in the air withdrawn from the several parts of the installation.

Suggested Explanation

Much thought had been given to the explanation of the foregoing observations, and it had been concluded that the effects had arisen from the putridity of the sewage and the oxidation of the putrid products by the air supply. The main erosive effect was at the varying liquid level, and was there dependent upon the amount of sulphuretted hydrogen in solution in the liquid. The gas was comparatively small in amount in the incoming sewage and in the liquid in the hydrolytic tank, and increased as the liquid passed through the hydrolising chambers. The results of this were especially well shown in the two channels; the alternate wet and dry area of the upper channel conveying the sewage from the rising main was less markedly affected, whilst in the lower channel the corresponding area was severely attacked. So with the two parts of the tank; the first part into which the sewage was delivered, and wherein comparatively little putrefaction took place, had not been affected to anything like the extent that the second part or hydrolysing chambers had.

When the level of the liquid fell it left the concrete which it previously covered wetted with a liquid containing sulphuretted hydrogen in solution. This wet surface was then exposed to the action of the air supply, which oxidized the sulphuretted hydrogen with the production of sulphur and sulphuric acids; these decomposed the concrete, the lime being converted finally into sulphate of lime. What the exact nature of the intermediate compounds was could not be stated, as none of them had been isolated, but it was probable that the active agent was sulphurous acid, as it was known that cement was insoluble in sulphuric acid. When the liquid rose again, the decomposed concrete was washed away either wholly or in part, and a fresh surface was exposed to action when the liquid fell again. It was the continuation of this cycle which led to the formation of the grooves at the varying liquid level.

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*Synopsis of a paper read before the Concrete Institute, London.

Concrete Above the Liquid Level

The erosive effects on the concrete above the liquid level were dependent upon the sulphuretted hydrogen evolved from the liquid and mixed with the air supply. Some of this gas was dissolved by the moisture which was present on the walls and roofs, from evaporation and condensation; it was then oxidized by the air, and decomposed the concrete. In this case the decomposed concrete either remained as a coating on the surface, peeled off, or crumbled away.

Effect on Concrete Tubes

In order to observe the phenomenon on concrete tubes, two 9-inch concrete tubes were selected, which were supplied by the makers of the paving slabs, previously referred to, and were composed also of similar materials in the same proportion. One of the tubes was coated with Dr. Angus Smith's composition (coal tar, pitch, linseed oil, and resin). They were placed side by side in the second part of the tank in such a position that they would be subjected to the rise and fall in the level of the liquid. At low level the tubes were not in contact with the liquid, and at high level the liquid rose to half the diameter

After the tubes had remained in the tank for eight months they were taken out and examined. The coated tube did not appear to have been affected, other than at the highest liquid level, where a thin line could be observed, and when struck it was found hard and had a good sound. It was noticed that there were two areas on this tube without any coating, due no doubt to its having been placed upon two supports to allow it to dry; these areas were soft on the surface and similar to the uncoated tube. With these exceptions the tube appeared to be in as good a condition as when first placed in the tank. On the other hand, the uncoated tube had a distinct line at the highest liquid level, which was found to be soft, and when tapped with a chisel had a dull sound; the interior of the tube which had been immersed appeared soft and had a dull sound when struck; the portion of the tube above the liquid level was unaffected, and when struck had a clear ring.

The author then referred to other cases of disintegration of concrete by sulphur compounds.

Conclusions

The deductions to be drawn from the investigations were that the gases in solution in sewage, and those expelled from it, arising from its decomposition, do act injuriously upon Portland cement concrete, notwithstanding the fact that the concrete is constituted of sound and good materials, when the following conditions prevail:

1. A high degree of putrescence of the sewage.
2. A moistened surface, which held or absorbed the putrid gases.
3. The presence of a free air supply.

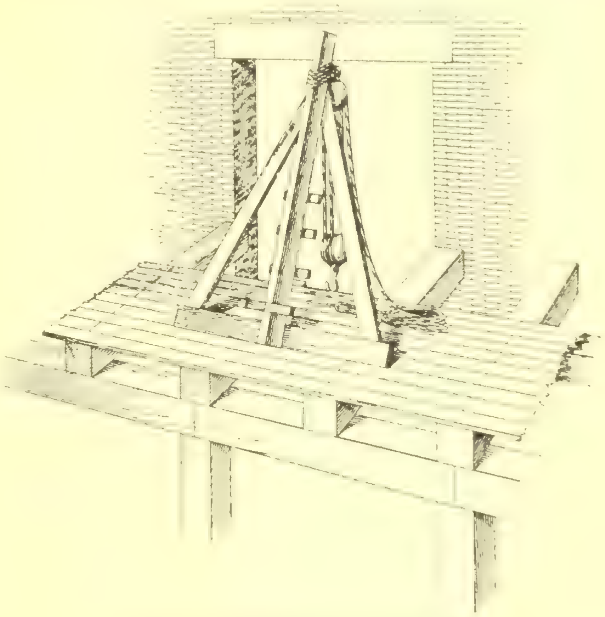
Further, that in the absence of one or other of the above enumerated factors little danger from erosion need be feared.

Good Roads Competition

The Manitoba Good Roads' Association has instituted a competition in which any four municipalities may participate, the first four applicants only securing the privilege of competing. Entries must be made before June 16, and the amount to be paid by a municipality to contestants for the mile allotted them must not exceed $15 for the three months. There are three prizes for each municipality, to be donated to individuals keeping the best mile of road. The first price is $25, the second $15, and the third $10.

An Improvised Builders' Derrick

There are times — and rather frequently, too — when it becomes necessary to hastily lower into or raise from basement or cellar, or from one storey of a building to another, great weights, such, for example, as safes, machinery, wooden cases, etc., and for this purpose some extemporized means must be devised in order to accomplish the work quickly and satisfactorily, says "The Building Age." An appliance for such a purpose is illustrated in the sketch shown herewith, the apparatus being rapidly put together by a builder for lowering a boiler, elevator machinery and dynamos from the street into the basement of a recently erected building.



An Improvised Builders' Derrick.

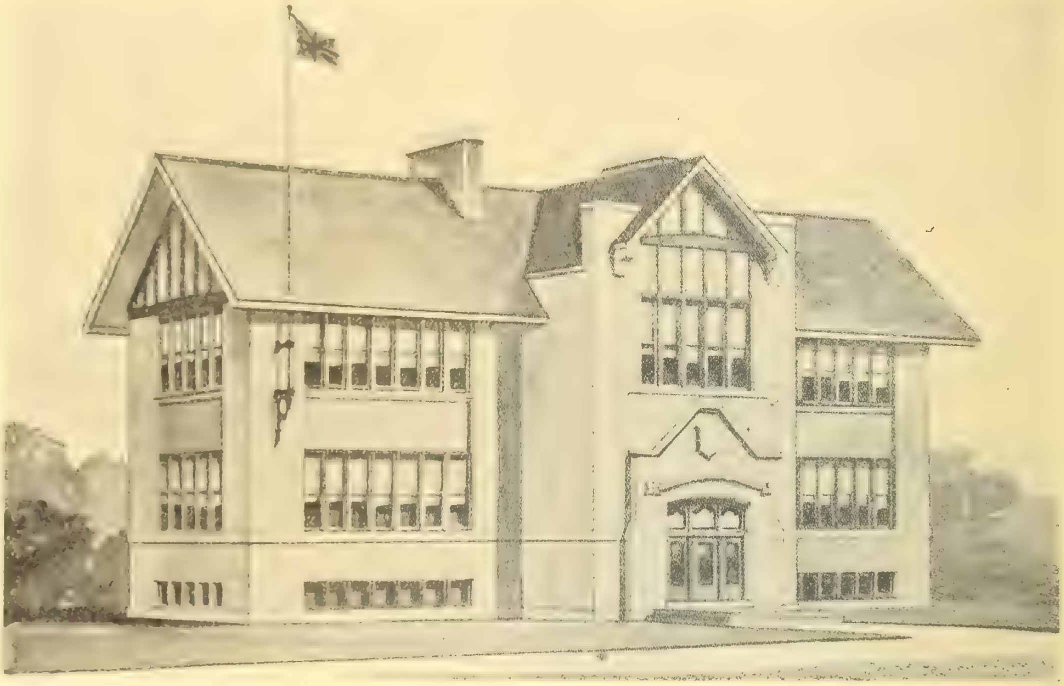
Virtually it might be stated that the drawing explains itself. Still, for the benefit of those interested, we might state that, as shown, the derrick is placed on a platform or bridge extending over the sidewalk, this bridge being not only for the purpose of providing a protection for pedestrians passing underneath against materials and scraps falling from the new building while in process of construction, but also, fully as important, affording a clear working space for the mechanics and the materials with which they are concerned.

The derrick is built up of a 2 x 8-inch or 3 x 12-inch timber, which is set on edge. Square to one end a piece of 1 x 8-inch flooring is solidly nailed and then on each side the derrick plank or timber, as it may be termed, is braced with two 1 x 6-inch strips or pieces securely nailed as indicated in the sketch. The derrick slopes at an angle of about 60 degrees when placed against a wall or lintel of a window opening, for example, and is provided with climbing cleats and tackle. Its construction is but the work of a few minutes and it is most useful when a job of this nature is to be done in a hurry.

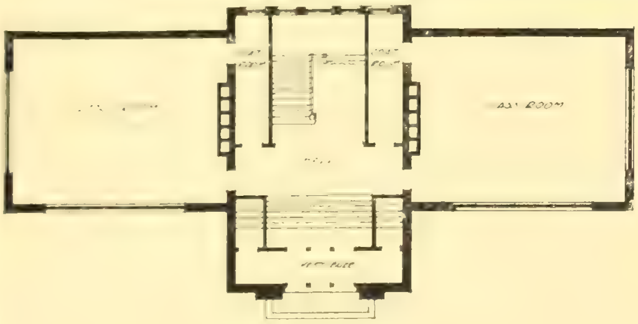
Building operations at Victoria, B.C., are very brisk. There is a great deal of work on hand, notably in residence construction, the demand for houses being particularly well sustained. The difficulty of contractors in every line is securing sufficient men for the work.

Distinctive Design for Small School

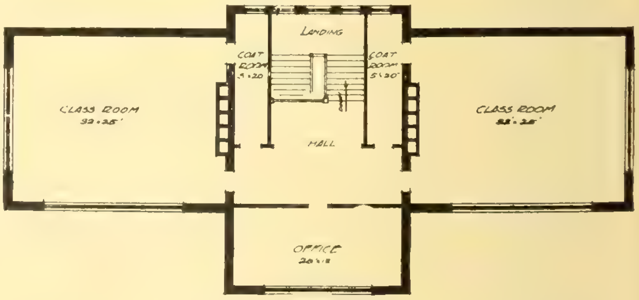
In the last issue of the "Contract Record," June 8th, we published a well considered design for an 8-room school at Amherstburg, Ont. With a view to assisting the smaller municipalities in the selection of a design and to show the latest ideas in this important branch, we herewith present perspective and plans of an attractive well designed 4-room school building. The school is designed in the Elizabethan style, a very pleasant yet striking use of stucco and exposed timber work having been used. The grouping of the windows carries out the idea of this style also. In a building of this kind all the pupils are certain to have plenty of light and air. The arrangement of the rooms assures an easy-running school with no congestion nor crowding.



Attractive 4-Room School, Offering a Satisfactory Solution to the Problems of Small Municipalities.



First Floor Plan.



Second Floor Plan.

The exterior material of this building is brick, both for walls and trimmings. Cement plaster on metal lath is used in the gables. The roof is slate.

A score of years ago the finest fronts of buildings were constructed of red pressed brick, carefully gauged to size, and shaded to one even color. The brick was laid in running bond, with the narrowest possible mortar joint, which was usually of a red color to match the brick. The effect on the eye was that of a surface so absolutely uniform as to produce the appearance of a pointed and ruled wall, says "Shoppell's."

The later discovery of clays that would burn brown, old gold, buff, gray and other light colors brought these into wide use and plain red brick was no longer the prevailing and exclusive style. One color has succeeded another in popularity, until to-day the intending builder has a wide range of color from which to select, even green and blue being at his command, these shades being secured by the use of glazed, or semi-glazed, surfaces. With the increase in the colors, there has been a rapid development in the matter of thickness, the color and texture of the mortar joints and in the style of bonding the face brick to the backing-up wall, so that the construction of a brick facade in the twentieth century has become a highly artistic proposition, capable of the best results, only under the supervision of a skilled architect.

In these days a brick wall, to be interesting, must have "life" and "texture," and these features can be secured by the use of brick that varies in color. This change of the fashion in brick is the strongest evidence

How to Light the Modern School Building

An Important Phase of Hygiene for Architects and Others
Notes on the Selection of Site—Width and Structure of Windows

By G. T. Forest

A combination of three requirements is necessary for the proper and efficient lighting of a school: (1) The selection of the site; (2) the requisites of the architecture and equipment; and (3) the teachers' duty. With reference to the latter it is important that the teacher bear in mind that he has an interest and responsibility in connection with each of the sub-divisions. He may have no hand in the choice of the site or in the planning of the building, but unless he knows the principles involved he is almost certain to violate seriously the requirements of school hygiene as applied to the lighting of classrooms

Selection of the Site

The value of high ground for the school site is inestimable; it ensures good drainage and more light by reducing the height of the obstructions and giving a freer play to the sunlight, the influence of which secures immunity from dampness. The building should be placed so that it is possible for each child to see the sky from his desk. The control of trees should be secured with the purchase of the site. If they do not interfere with the lighting of the building well and good, but this point should be carefully considered when inspecting suitable ground. The question of how to secure sunlight for all the rooms during some part of the day has led to considerable discussion as to the best direction for a building to face. Buildings should not be placed so as to coincide with the points of the compass, otherwise the north side rooms, if lighted on one side only are cut off from the sun, while south rooms may get too warm in hot weather. To avoid this the building should face the middle points of the compass. By this arrangement each side receives the sun at some time during the day. A frontage of this sort makes southeast rooms most desirable, southwest next, then the northeast, and the northwest is least desirable, as the effects of the sun are only felt after the children have gone for the day. These distinctions, however, must not be carried to an unnecessarily fine point, but when such a site can be obtained as readily as another it should be given the preference.

If a building is so planned that it is impossible to secure the sun for each room the deficiency should be made up by increasing heating and ventilation. Having determined the character of the building be careful to put the light in the rooms used for school work. This, of course, is the mandate of common sense, but how many times do we see that these considerations are not always regarded—e.g., assembly halls put on the south side, teachers' rooms monopolizing windows which should go to light classrooms, and staircases often to be found on the side of the building having the best light

Amount of Window Space

The relation of window space to floor space should be at least one to six; this ought to give the minimum of defective eyesight. Knowing the amount of window space required as compared with the floor space, the next problem concerns the location of the light. Here two considerations are involved: (1) The full light must shine on the children's work; (2) the light must not be faced by pupils or teacher.

The conditions are fulfilled by adequate lighting from the left, and it must be borne in mind that the light from the highest part of the room is by far the most valuable. That which comes through the lower panes goes to the floor. No shadows are cast by left-hand light. Light from behind, however, casts shadows on the books from the head and body of the pupil. Light from the right is obstructed by the pupil's hand, and there should be no light facing the pupil. For reading purposes, front lighting is exceedingly bad, as the light is thrown on the binding of the book instead of the page. Of all possible combinations of bilateral lighting, that with windows at the left and right is much to be preferred. This form of lighting is very often seen in small country schools. Also care should be taken that the lighting from the right hand should be shaded, leaving the chief source of illumination from the left. Light from the left and rear is particularly trying to the teacher, although from the pupil's standpoint alone the left and rear lighting is usually better than right and left, for, as a matter of fact, the children farthest away from the windows on the left get from that direction not only the light from windows on that side, but even the light from most of the rear windows comes to them from the left.

In furnishing a classroom, seats should never be placed close to the windows; the last desk nearest the wall facing the teacher should always be in a line with the side of the window openings, and not be placed in the shadow of the wall.

Width and Structure of Windows

So many varieties of classroom windows are in vogue both as regards design and construction, and having regard to the ventilation of the classroom, that it will be sufficient here to outline a few of the main principles which determine their use. It is well to remember when designing windows that the light should enter the room as a unit, so that there will be no distinguishing cross lights, no distinctly outlined shadows, and one light will shade into another without any visible lines. In other words, there should be broad piers or mullions between the daylight openings. On that account I am not an advocate of planning classrooms having only two windows, as this necessitates a considerable amount of wall surface between them. I am of opinion that the best and most suitable form of classroom window for an ordinary sized classroom, to accommodate, say, 50 or 60 children, is a 3-light one; but it is hardly possible to construct brick piers of sufficient strength in a building of any height that will not interfere considerably with the light. Eighteen inches seems to be the width usually adopted, but as this width throws a shadow on the desks nearest the window, cast iron mullions are, I believe, now used, although I have not seen any. These are used with heavy sashes and with the window frame bolted directly to them. In this way it is possible to put the windows sufficiently close and at the same time provide sufficient strength. When brick piers are used they should always be bevelled on the inside.

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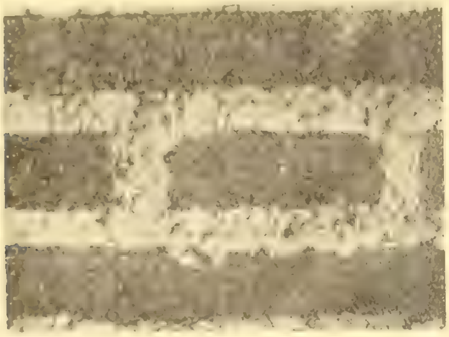
*Extracted for this journal from a paper read before the Royal Sanitary Institute

Suggestions in Brickwork

Till some twenty-five years ago bricks were commonly considered as convenient substitutes for stone where the cost of a building was to be kept down, but during the last quarter of a century, and particularly during the last ten years, architects and builders have realized that there are possibilities in building with bricks which were formerly undreamed of even by the most progressive men.

It used to be thought that bricks should be of as even and regular a texture and color as possible, but of late years it has been found that a less mechanical effect can be produced, and in some instances really artistic results can be obtained by means of somewhat rougher bricks laid with a wider jointing or in mortar of a different color from that usually employed.

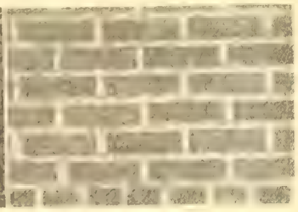
The accompanying illustrations show what is being accomplished by a progressive firm of builders, who wish to impress on their customers the desirability of a great variety, and the beautiful effects which may be obtained at comparatively little cost by the use of a little artistic taste.


Late Fashions Show Ruggedness in Texture and Irregularity in Appearance

Both in this country and in Great Britain architects are becoming keenly interested in getting away from the dull monotony of ordinary brickwork, and the builder who can point to some of the designs shown in the accompanying photographs can often secure customers who would otherwise pass him. This is especially the case with residences in the country and smaller towns.

Nothing harmonizes quite so well as a variegated brick set in an appropriate mortar for country residences; the surrounding green and the play of color in the brick help to show each other off. On the other hand, few colors are more glaringly discordant than the beautiful green of the trees and grass and the ordinary dull and lifeless color of monotonous bricks.

Brick of Even Color and Narrow Joints


Detail of Brickwork Showing Rough Brick and Wide Motar Joints

Modern bricks are no longer made in the same way as formerly, and the play of colors now obtainable, together with the more artistic texture of the surface, are such as to commend themselves in all places where stone is expensive or undesirable, and in many others where stone and brick are in competition.

A glance at the illustrations is sufficient to show the force of this argument, and in addition to the standard sizes further effects can be obtained by employing narrower bricks of the old "Roman" type.

Brick of Varying Shades with Wide Joints

Tapestry Brick in Variable Colors Laid in Black Mortar

A style of brickwork which is rapidly increasing in popularity in this country, is made of vitrified bricks, or "pavers." These are remarkably dense and waterproof, and of a dark red or even bluish color. The headers are often darker than the stretchers, but this is considered to increase the effect rather than diminish it. The Galesburg bricks associated with Milwaukee are somewhat too harsh in appearance for this kind of work, but the redder varieties from that district are admirable, and may well be used in conjunction with a few vitrified bricks.

The wide mortar joint requires considerable care, or it will offend by its coarseness rather than please by its rugged beauty. When properly used, however, it undoubtedly adds to the interest of buildings in which it is employed.

Slates or tiles should be chosen to harmonize with the brickwork, and, like it, should have some variety of coloring, as a tiled roof, the whole of which is a bright brick red, is scarcely less ugly than the monotony of a slated roof. Fortunately, the roofing tile manufacturers appreciate this fact, and supply tiles which are admirable in every respect.—National Builder.

Cost and Methods of Sewer Work at Hamilton, Ont.

Some interesting information is noted in the annual report of City Engineer Macullum, of Hamilton, Ont. The following extracts are culled from this report:

Street Railway Work—New street railway tracks were laid on James street from Herkimer to Barton street, and on Barton street from James street to Sherman avenue. The rails used were 9½-inch girder lip rails, running 94 pounds to the yard and double bonded to each other. They were laid on steel ties at 10-foot centres, these ties being 6 inches deep, 6 feet, 6 inches long, having a top web of 4 inches and a bottom one of 8 inches. Every 5 feet tie-rods connecting the rails were placed. The concrete base of a 1 : 3 : 5 mixture and 6 inches in thickness was placed beneath the cross ties, and when rails were in position this same mixture was placed to come up above the base of the rails, leaving sufficient space for a ½-inch cushion of cement and sand and a 3-inch creosoted wooden block.

On James street the space between the rails and one foot beyond outside rails was paved with creosoted wooden blocks of long leaf Georgia pine. The spaces between the blocks were filled with cement grout, with the exception of the portions outside of rails, which were filled with an asphalt filler.

On Barton street, from James to Sherman avenue, the space between the rails was paved with vitrified brick laid in cement grout, and one foot outside of the outer rails was paved with wooden blocks filled with the asphalt filler.

On Barton street great difficulty was experienced in keeping the traffic off the brick paving a sufficient length of time to ensure the proper setting of the cement grout filler. Where the traffic was resumed too soon, on some portions of this pavement, the grout filler was destroyed, thereby lessening the life of the pavement. The remaining portions of the pavement between the rail and brick gutter was paved with asphalt.

Pavements—Below is appended a list of all streets paved with asphalt during the year:

Street	Sq. yards.	Cost per Sq. yd.	Total Cost
**John street	2,181	1.27	$ 3,302.11
*Park street	1,766	1.38	2,547.77
West avenue	897	1.20	1,082.29
Webber avenue	585	1.24	725.12
Market street	2,739	0.75	2,056.52
James street	4,625	0.95	4,617.95
*Barton street	7,742	0.83	6,419.75
*Barton street	13,570	0.92	12,442.46
Totals	34,105		$33,193.97

**Cost of brick pavement 8 feet wide alongside curb between Hunter and Jackson streets included.

*Cost of binder included in these figures.

Repairs to the extent of 3,129 square yards were made to the asphalt pavements at a cost of $2,987.94, or 95.5 cents per square yard.

A creosoted wooden block pavement, having blocks with grooves, because of the grade, was laid on James street, from Herkimer to a point 200 feet south of Markland street. The spaces between the blocks were filled with an asphalt filler.

A further decrease in the amount of cement walks laid during the year is shown below in comparison with past years. The old wooden walks have now been entirely superseded by cement walks, which leaves only cement walks to be constructed on new streets that may be opened up.

Cement Curbs Constructed in 1909

Total lineal feet	3,051
Total cost	$1,070.79
Average cost per foot ... cents	35.1

Cement Curbs Constructed in 1908

Total lineal feet	569
Total cost	$253.73
Average cost per foot ... cents	44.5

The mileage of cement walks laid each year, from 1897 to 1909, is as follows: 1897, 0.5; 1898, 0.67; 1899, 5.17; 1900, 11.13; 1901, 23.7; 1902, 34.1; 1903, 21.43; 1904, 18.58; 1905, 18.89; 1906, 9.93; 1907, 8.23; 1908, 8.06; 1909, 3.9; total, 164.29 miles.

Outfall Sewers—The main overflow sewer on Catharine street from the end of the present sewer to the revetment wall was completed. This sewer, which is 387 feet in length and 36 inches in diameter, was built on a pile foundation, the double row of piles being spaced 6 feet apart. The base was made of a reinforced concrete slab, while the barrel was made of ordinary concrete 9 inches thick. This sewer, including the piling, cost $2,978.75, or $7.69 per linear foot.

The main sewer on Ferguson avenue was also extended to the revetment wall. Part of this sewer was constructed of concrete and part of 5-foot cast iron pipe laid on pile bents and stringers. The concrete portion of the sewer was completed and the iron pipe placed in position and caulked. The pipe has yet to be connected to the revetment wall and to the concrete end of the sewer.

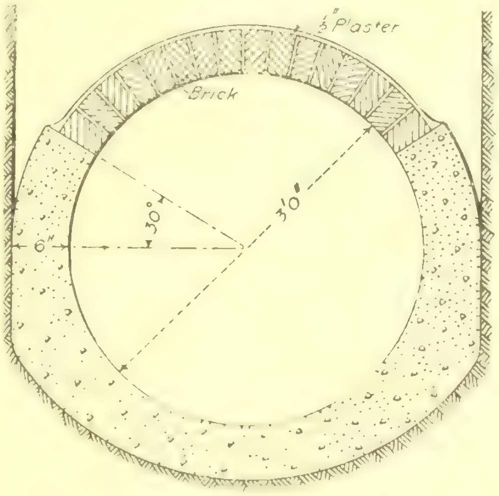
The concrete base of the sewer was constructed on a foundation composed of 9-inch I beams, placed 4 feet apart and checked into the old piles of present flume. The bottom and sides of this sewer are flat, but top is arched. The total cost of the concrete part of this sewer, not including the I beams, was $2,168.48, or $5.22 per foot. This sewer was 415 feet long, having the concrete 9 inches thick.

West End Sewer—This sewer, emptying into the marsh, burst during the summer. It is draining a district too large for it, including the Provincial Asylum, and besides being too small is also in bad condition. A new sewer 6½ feet in diameter, together with a disposal plant, has been designed and is now awaiting the decision of the Provincial Government as to the proportion they are willing to contribute towards its construction and maintenance.

Mountain Sewers—The recently annexed mountain top district had a sewerage system built during this summer. The construction was entirely in rock, and to reduce cost where water pipes were laid, the same trench held both pipes. Besides possible settling of the water pipes, it will be extremely difficult to locate breaks using this method of construction.

Itemized Cost of Storm Water Drain

A 3-foot storm water drain with concrete invert and sides and a brick arch has been built recently at Indiana, Pa. The following particulars of the work are furnished by the "Engineering Record": The length of the line was 700 feet and the depth of the trench, which was 4 feet wide, averaged about 5 feet; the material was earth, and was taken out with pick and shovel.



Cross Section of Storm Water Drain

Concrete was mixed by hand in the proportion of 1:3:5 and deposited, by shovelling into a trough, directly against the sides of the trench and on the bottom which had been brought to a circular shape at the required grade. The mix was sloppy and rammed into place with a curved tool, the average thickness of the invert and side walls being about 7 inches.

The forms were of wood and were built in lengths to 10 feet. Each section was made up of two longitudinal pieces fastened together by five ordinary door hinges fixed to 2-inch braces spaced every two feet, so that the forms could readily be collapsed and withdrawn after the concrete had set. They were held 6 inches above the trench bottom by a single line of brick, placed on end and spaced on 2-foot centres. Cross-braces, 2 x 2 inches, were nailed temporarily to the 2-inch braces of the forms to act as spreaders, and 2 x 4-inch braces were extended from the bottom of the form, where they were held by a single spike, into the sides of the trench, in order to prevent the centre from rising when the concrete was rammed beneath it.

The brick arch, shown in the sketch of the sewer reproduced herewith, was put on a 4-foot wooden form supported from the invert by a 2 x 4-inch post, and moved forward as each section was completed, making the brick work continuous. The arch was plastered with mortar.

The cost of building this drain, as given by Mr. Thomp-

Peale, borough engineer, under whose direction the work was carried on, is given in the accompanying table:

3-foot Circular Drain, Concrete and Brick.
Total length, 700 feet. Average depth of trench, 5 feet.

Item	Cost per foot.
Excavation and back fill	$0.60
Cement, $1.20 per barrel	.174
Sand, $1.25 per ton	.104
Stone, $1.25 per ton	.208
Mixing and placing (5 men and foreman placed 60 feet in 10 hours)	.194
Setting forms	.029
(Cost of forms (60 feet at 67 cents for 700 feet)	.058
Removing forms	.022
Brick (old paving brick, $5 per M)	.135
Bricklayer and helper	.094
Mortar	.085
Carting	.100
Incidentals	.030
Total	$1 833

Labor at $1.75 for 10 hours.

Reinforced Concrete for the Small House*

By C. R. Knapp

The small and medium priced house in reinforced concrete is to-day a reality and not a theory. It was not so long ago that concrete was considered suitable for the large structures only, and even to-day the big man, in concrete, will tell you that the small house, in concrete, cannot be built in competition with other building materials. They are right, in so far that it cannot be done using their methods, which are only adapted to the large structure. It can be, and is being built successfully, by using any one of a number of systems that are adapted for the small work, which would be just as much out of place in large work as the large methods would be in small work. The small house is the one thing nearest to the masses. Anything that pertains to a home appeals to them. They are watching all concrete work with much more than ordinary interest.

Size of Wall for Two-Storey House

Not so very long ago, to build less than a 12-inch solid concrete wall for even a one-storey building was considered unsafe. Now a 6-inch reinforced wall is found to be of sufficient strength for any two-storey house. This saving in labor and materials has greatly reduced the cost and helped very much towards making the small house possible in reinforced concrete. The 6-inch wall will not show any dampness, if the concrete is properly mixed and placed. For a summer home, inland or seashore, no plastering is necessary, thus the cost is reduced to a minimum. For an all-the-year house, in a warm climate, plaster directly on the wall, thereby the furring and lathing can be done away with. If the house is in a cold climate, I would advise that furring blocks be used, with the usual brown coat of plaster, as otherwise the wall may be too cold.

The wall that seems best suited for house construction and one which I believe has more advantages than any other is the hollow wall, consisting of two 4-inch walls with a 4-inch air space between. Both walls are reinforced with ⅜-inch or ½-inch steel rods spaced upright, at least every 18 inches, staggered and horizontal about 3 feet apart. To tie the two walls together, I leave a 3-inch web every 8 feet, and have metal ties every 2½ feet both ways. The double wall ensures against dampness and makes the house cool in summer and warm in winter. The air space may be utilized as a ventilating system, allowing each room to be ventilated without regard to any other room.

The extra cost of double walls is more than offset by the saving in being able to plaster directly on the concrete, using only one brown coat or the white putty coat. A beautiful and artistic effect may be had by so erecting the inner walls and partition walls (if of concrete) that they do not require plastering or other covering. Concrete has sufficient merit to be treated frankly as such, instead of being hidden. Now introduce color and decoration by using tiles and mosaic to give the needed life and relieve the monotony, but not for the purpose of hiding the concrete, which is exposed frankly where decorations do not occur. Then decoration will exercise its true function, by emphasizing, instead of hiding structural beauty. It is almost needless to say that, where this effect is sought, concrete, being a plastic material, is admirably adapted for this purpose. In this way we "decorate construction," and we do not "construct decoration." In many instances the effect of the decoration is so great as to at once convince the uninstructed.

To make the air space a system of collapsible cores is generally used. A better way, to my mind, is to make a concrete core, similar to a terra cotta partition tile, which is, of course, left in the wall. By using this method from one to two inches of concrete may be saved without affecting the strength. The core can be made on the job for about half what the terra cotta partition tile will cost.

Damp-Proof Character of 6-inch Wall

An illustration of not only this simple method of surface treatment, but also the damp-proof character of a thoroughly well-made 6-inch wall, is the seashore house of Mrs. Gaston Daus, at Ocean City, N.J., within a block of the beach. While most of the rooms are furred and plastered, there are several apartments in which the porch floor serves as a ceiling, in which the walls have not been plastered. The house was built during the past summer and not the slightest sign of dampness or condensation has appeared. For weeks a pool of water lay on the porch before the top coat was put on, and no dampness appeared underneath. After protracted storms the surface seemed to dry off instantly, while neighboring houses of brick and even frame construction retained evidences of moisture upon the outside, long after the concrete house had assumed its natural color.

People are demanding fireproof houses to-day. They must, however, be educated to pay a higher first cost, if necessary, for this class of construction, and to realize that it is economy in the end, even at the increased cost. Repairs and insurance are practically eliminated. There is also a saving of 25 per cent. to 40 per cent. in the cost of heating, besides having a house that is thoroughly sanitary.

In the matter of cost we constantly see unfair comparisons made between concrete and other materials. For example, you and I, as cement workers, build a dwelling of reinforced concrete from cellar to roof. This type of house is expensive, and immediately somebody exclaims: "My, your concrete house cost more than my brick house!" As a matter of fact our critic has not a brick house, in the sense that our house is concrete, he merely has a house with brick walls. Suppose he were to introduce the durable and fire-resisting features of the all-concrete house, by having his floors, stairways and other features in brick. What would become of his theory as to excessive cost of concrete? It is in this way that the two materials should be compared. We can easily hold our own when it comes to mere wall construction, and more than hold it when our opponents seek materials of like durability for interiors and roofs.

One of the first things to do in building a concrete house is to get a concrete design, for, of all building material, concrete requires the most individual treatment. Many houses are built of concrete, after being drafted for brick, stone or frame and this is the reason, some people say, they do not like the looks of a concrete house. The houses they have in mind probably would not appeal to us any more than they do to them.

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*Extracted from paper read at the recent Convention of the National Association of Cement Users.

Live-Loads and Life of Railway Bridges

For what Loading should Railway Bridges be Designed—A few Practical Suggestions Emanating from Developments of Last Quarter of a Century

Railway bridges have always occupied a peculiar position among engineering structures on account of the steady increase in engine and train weights. Bridges could not remain "modern" very long, but were outgrown after a very short period. It was always the custom to design for existing loadings, or at most only a small margin of increase. But loads continued to increase and to render new bridges obsolete.

The same custom still prevails. There is to-day better reason for expecting that train loadings will remain practically stationary. Freight cars have reached a very high capacity, and engines, while still increasing in weight, show little or no increase in wheel-loads but distribute the additional weight over added length of base. May we, therefore, expect that the bridges which are now being built will have a longer term of life than those of the past generation?

Just now many railway bridges built in the 80's are being taken out and replaced by heavier structures. An example of such renewal, interesting for a variety of reasons, is the Ohio river bridge at Point Pleasant, on the Kanawha & Michigan Railway. This bridge lived to be 25 years old. A parallel instance from a larger and more prominent railway is the case of the Panhandle bridge over the Ohio at Steubenville, O. This is only 20 years old, but it has also become too light and is therefore being replaced.

These bridges, as well as many others which are being removed, have not rusted out, but on the contrary are usually in excellent condition as regards corrosion. On the score of rusting alone, they would be only just entering the prime of life. But the weight of trains outgrowing their strength, they show the very short life of 25 years at most.

The Developments of Two Decades

Doubtless the bridge designers of 20 years ago did not anticipate this; they did not believe that their bridge would be outgrown in barely two decades. They were at that time taking down the bridges of the preceding generation, "antiquated" bridges, and had before them good models of what to avoid in the way of short-lived construction. They knew how rapidly engines and trains had become heavier, and probably believed there would be little further increase. Yet hardly a dozen years had passed before their estimated loadings were surpassed by the actual rolling stock, and soon thereafter the matter of renewal became a question only of favorable opportunity.

Doubtless also the designers of to-day are loth to believe that their work is to live only 20 years. With thoroughly modern design in all details, and with engine and train weights apparently near their physical limits, there is no obvious ground for fearing that, with good protection against rust, our new bridges of to-day may not be fully satisfactory after 20 to 25 years. It is quite clear that this view must be held rather generally, since the loadings on which new designs are based contain but small allowance, if any, for future load-increase. Otherwise, it would be a simple and comparatively cheap matter to provide for a considerable increase in live-load, certainly much cheaper than the complicated and bothersome rebuilding under maintained traffic, of which kind of work we have a fair sample in the account of the Point Pleasant bridge.

It is a fact that there is no immediate prospect of greatly increased loadings. The 50-ton car is not likely to be far outstripped even for the heaviest bulk-freight traffic. For general freight and for light bulk-freight, on the other hand, even this capacity is needlessly high. Even if physical limitations did not govern, the factors of general economy of transportation set a limit to car capacity. On the other hand, engine loadings are of less importance to-day, because aside from local effects they do not amount to more than our maximum train loadings. The heaviest locomotive averages no more per foot of track than the heaviest freight-train. Future slight increases of engine weights on the basis of present-day construction are not likely either to change this state of affairs or to increase the local effects of wheel loads.

But to give the opposing argument its due, we must recognize that 50 years, or even 25, is a long period of time, and that much may happen before it is over. We may feel able to forecast the detail development of railway practice for five, perhaps for ten years, but can we say as much for 25? Can we confidently assert that the strength of rail, of draft-gear, of car wheels, etc., and all the other limiting factors of to-day, will not undergo more or less extensive modification? Or that particular kinds of traffic may not develop which will demand far heavier transportation units than 50-ton cars? If electric operation becomes at all extensive, will it remain within the limits of present-day transportation practice in all respects?

Neither Corrosion Nor Wear.

There is much force in the lesson of the past, that railway bridges never wear out and never rust out, but always are outgrown; and there is equal force in the oft-repeated lesson that bridge replacement is very costly indeed, besides involving a risk to safety of traffic which in effect still further raises the cost of the undertaking. Experience has not shown us what length of life we can expect from a railway bridge. But it has shown, at least, that for mere durability a bridge may last very much longer than 20 or 25 years. In fact, there is no reason why a life of 50 years should not be realized. But if that be true, should we not design for such contingencies as 50 years of the future may bring?

It is not our purpose to suggest anything like the changes of the past quarter-century. The designers of the early 80's might profitably (as we now see it) have doubled the live-loads then existing, before proceeding to design their bridges. Of course railway managers of those days would not have permitted such extravagance. To-day they are more liberal, perhaps. Yet a 100 per cent. increase over the live-loads of to-day seems wholly out of reason. A more moderate ratio of increase, however, would be a protection against many future contingencies of load increase, besides giving a margin for the special high loads that need to be transported occasionally, as heavy single pieces of steel, very heavy machinery, large blocks of stone, and the like. In addition it would raise the factor of safety, and give increased security generally.—Engineering News.

"Good Roads" Campbell, the Deputy Minister of Public Works, delivered a lecture upon his favorite topic before the Canadian Club at St. John, N.B., last week. Mr. Campbell is remaining in the maritime provinces for three weeks.

Mr. Lionel H. Buck, of Vancouver, has submitted a report dealing with the question of drainage and sewerage at Chilliwack, B.C. He estimates that a complete sewerage system for a population of 5,000 will cost $166,760, and a drainage system $70,000.

English Practice in Sewage Disposal

An Account of what is being done by the Urban District Council of Chiswick[*] Interesting to Canadian Municipalities[†]

By J. H. Abbot, Resident Engineer[*]

The urban district of Chiswick comprises an area of 1,337 acres, of which about 92 acres are represented by the water surface of the river Thames.

The district, which is bordered on three sides by the river Thames, is very flat, the sewers generally being laid at flat gradients. Some of the branch sewers have to be flushed regularly by means of a water van to prevent the accumulation of deposit in them. The surface water from streets in the districts is partly connected to surface-water drains and soakaway pits in the subsoil, but many of these latter have connections to the sewers. Practically the whole of the roof water from houses and paved yards is admitted to the sewers. The daily average dry-weather flow of sewage amounts to 1,500,000 gallons, or 43 gallons per head, which is accounted for by the large quantity of waste waters from breweries, factories, and steam laundries, and also by subsoil leakage into some of the older main sewers which are laid in water-logged ground. During heavy rains, storm water diluted sewage frequently reaches the works at a rate exceeding ten times the average hourly rate of flow in dry weather, and it is necessary to pump at this rate to avoid flooding in certain parts of the district. It is seldom, however, that the total flow in 24 hours in wet weather exceeds three times the volume of the dry-weather flow. A rainfall of ½-inch will produce a total flow of twice the average dry-weather flow. There is one storm overflow controlled by penstocks at the disposal works discharging direct from the sewers into the river; but this is practically useless, as it is tide locked at half-tide and submerged to a depth of 13 feet at high water.

Description of Works—The works were originally opened in 1879, and since then practically no alterations of any importance have been made until during the past five years, when the additions have been somewhat extensive. They include the change from pumping by steam to pumping by gas power, the installation of a destructor, enlargement of the press house, and the addition of extra precipitation tanks and filter beds now in the course of construction. The sewage, as it enters the works, passes through the screening chamber, where two screens, having a mesh of ½-inch, are placed, and after receiving a dose of milk of lime, passes onwards to the pump-well. The screenings and filth removed on the screens are burnt with the house refuse in the destructor. The total pumping capacity is 16 million gallons per day, and consists of two sets of 10-inch Gwynne centrifugal pumps directly coupled to Crossley gas engines of 20 b.h.p. and two sets of 15-inch centrifugal pumps directly coupled to Crossley gas engines of 36 b.h.p. The total lift is 20 feet, and one of the 10-inch pumps can easily pump the dry-weather sewage flow in 17 hours. Town's gas is used throughout, and the engines are started by means of compressed air. In the engine room there are also two four-cylinder single-stage Reavell air compressors directly coupled to Crossley gas engines of 16 b.h.p., each capable of delivering 50 cubic feet of free air per minute compressed to 100 pounds per square inch. These supply compressed air for the sludge presses, and the engines are also utilized for driving shafting for the lime mixers, circulating water pump, and hydraulic power pump. The air compressors are fitted with an automatic unloading device, which throws off the load when the pressure in the air receiver exceeds 103 pounds, the load returning automatically when the pressure falls below 97 pounds. By means of a three-way valve the air compressors can be worked as vacuum pumps, and when so worked are employed for charging the centrifugal pumps before starting and also for lifting sludge from the sludge pit. A 6-k.w. direct-coupled generating set, consisting of dynamo and gas engine, supplies the works with electric current at 100 volts. The lime mixing house contains two lime mixers and an alum vat. The sewage is treated with milk of lime, aluminoferric and copperas. The dose of chemicals is varied to suit the requirements of the sewage, but the usual amounts employed per gallon of sewage are 8 grains of Buxton lime and 5 grains together of alum and copperas.

Tanks—The precipitation tanks are eight in number, and have a total capacity of 1,660,000 gallons; they are fitted with lateral openings in the side walls for series working, and floating arms for decanting off the supernatant water when removing sludge. These floating arms can either discharge direct to the river, or partly on to the filter beds, or by means of a 10-inch centrifugal pump, driven by a gas engine; the liquid in the tanks can be delivered into the main pump delivery channel for retreatment through the tanks. The sludge is swept from the tanks into the sludge pit, from which it is lifted by means of a vacuum into the sludge receivers. From the receiver it is forced into the sludge presses in the usual way, and the cake produced is partly burned in the destructor and partly barged away or sent away by rail to farmers. A cable tramway is used for transporting the pressed cake from the press shed to the destructor. The press house contains two of Johnson's presses with 38-inch diameter plates, and three Warner presses with plates 42 inches square; the output of the fire presses together amounts to 112 cwt. per operation. The presses are fitted with hydraulic ram heads as a labor-saving device to facilitate opening and closing.

Filters—From the precipitation tanks the effluent passes onwards to the filter beds, which are at present being constructed, and ultimately reaches the river by means of the new outfall. The filter bed walls, carriers and channels thereto are all constructed of cement concrete. The floors of the beds are of concrete 9 inches thick. There is a cross fall of 3 inches from the sides of the beds towards the central sub-drain, which has a longitudinal fall of 9 inches, and the effluent is discharged into a culvert constructed underneath the supply carriers. There are 13 filter beds, each of ¼-acre area, or a total of 3¼ acres, 3 feet 6 inches deep, arranged for single contact and controlled by Adams' hydraulic apparatus, as well as means for hand regulation. The drainage tiles are of Naylor's and also Stiff's patterns, placed in rows 9 feet apart, and the filtration area is capable of dealing with three times the average dry-weather sewage flow. The syphon feeds are arranged to take any quantity from the minimum flow that may be coming to them up to three times the mean average dry-weather flow, so that when it becomes necessary to pump at this rate the beds will receive the tank effluent automatically when working one cycle without it being necessary to start additional feeds, the excess flow when pumping at higher rates of flow escaping over the storm overflows after treatment in the tanks. With two cycles in operation the amount the feeds would be capable of discharging is six times the average dry-weather flow, but it is thought that it will rarely be necessary to have more than one cycle in operation at one time.

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[*] Paper read before the Association of Municipal and County Engineers.

[†] Chiswick is one of London's best known western suburbs Its present population is approximately [illegible]

Destructor—The destructor consists of four cells of the Horsfall standard back-fed type, each capable of consuming 15 tons of a mixture of two parts by weight of house refuse to one of pressed sludge cake per 24 hours. During an official test of the destructor carried out in January, 1906, the quantity of water exaporated was 0.78 pound, from and at 212 deg. F. per pound of a mixture of house refuse and sludge cake in the proportions of 3 to 1. The refuse burned per square foot of grate per hour was 37 pounds. The furnace gases pass through two Babcock boilers on their way to the chimney shaft and also through a Horsfall centrifugal dust catcher, which effectually arrests fine particles of flue dust. The steam generated mainly goes to supply the steam jets for the forced draught, but enough is produced to supply the 20 h.p. engine in the workshop which drives the shafting in the workshop, sewage screens, flag-making plant and sludge tramway, and steam is also used through an ejector for creating a vacuum instead of running one of the air compressors for this purpose, and also for heating the workmen's baths, etc. In the destructor boiler house there is a Lassen and Hjort water softener for softening the boiler-feed water, which is obtained from a shallow well on the premises and er railway and tipped on the clinker cooling space adjacent to the flag-making house.

Flag-making Plant—The flag-making plant consists of a Horsfall granulating clinker crusher and mortar mill and a single mould 400-ton hydraulic press by Fielding & Platt, which is fitted with their patent vacuum plate arrangement for removing the slabs from the mould. The flags are made with either plain clinker faces or with ½-inch wearing surface of granite chippings and cement. The mixing of hhe concrete of which the flags are composed is done by hand. The press works with water at a pressure of one ton per square inch, furnished by two hydraulic pumps and stored in an accumulator. The author of these notes acted as resident engineer in charge of the installation of the whole of the pumping plant and auxiliary machinery, the erection of the destructor furnaces, boilers, and chimney, the flag-making plant, offices, etc. Since then he has acted as engineer to the Chiswick Council in the design and construction of the recent extension of the press house, and of the present scheme of extensions of the precipitation tanks and filters The cost of these extensions has been $125,000.

An all-mixed concrete road, 18 feet wide and 1 mile long, has been built in Wayne County, Mich., and has given such satisfaction that 8 or 10 miles more are contemplated, according to Mr. G. A. Burley, who described the work recently in "Good Roads." After trying other methods, expansion joints were put in at 100-foot intervals, a strip of heavy 4-ply tar paper being introduced between abutting sections. The maximum expansion for such a section, Mr. Burley states, will not exceed ⅛-inch and after a season's traffic the expansion joints were not seriously affected by spalling. On next year's work it is the intention to omit open joints entirely and lay the concrete in 25-foot sections with tar paper between each pair. A 1 : 2 : 4 mixture is used by Mr. Burley, and according to him the all-mixed concrete road has shown superiority over macadam from the standpoint of maintenance and in some cases was cheaper in initial cost. On the mile stretch referred to the contract price for grading and placing concrete was a little less than $1 per square yard

The Belleville Cement Mills, which have been idle since the inauguration of the merger, have commenced operations. One hundred and fifty men arrived at Belleville recently to operate the mill. The Lehigh mills, two miles from Belleville, turn out 3,000 barrels a day. The demand, however, is so great that another mill is necessary

Trade News from Montreal

Features of Supply Market—A Good Season for Cement —Gratifying Progress Indicated by Building Returns

Montreal Office of the "Contract Record."
Montreal, June 13th, 1910.

The continual rainfall of the past fortnight has undoubtedly hindered and depressed the general contracting trade. Teaming, for instance, has been rendered difficult and contractors with large excavation work on hand have not made the most satisfactory progress. In fact in all lines there has been a noticeable lull. It is only natural to expect therefore that with better weather conditions prevailing there will be a big effort made to rush construction work. Even at present, with the large amount of work on hand, the scarcity of teams and teamsters is a pre-eminent feature, and one large firm of contractors have been forced to keep two men employed in scouring the city gathering teamsters in order to keep abreast of their excavation work. The higher prices usually demanded by teamsters in the summer months are also very much in evidence and $7 for services of man with team is now in some cases demanded.

Market News

The figures at which the city obtained their supply of cast iron pipe are much lower than quoted previous years. This low level of prices is based on the reduced cost of pig iron in England, where it is manufactured. This year, too, Canadian dealers are forced to pay higher freight rates than ever before on their supplies.

Prices for cast iron water pipe in standard weights are approximately as follows, f.o.b. Montreal, per net ton: 4-inch, $32.50; 6-inch, $32; 8-inch, $31; 12-inch, $30.

Cement is enjoying a good summer season and from the headquarters of the Canara Cement Company we learn that it is moving quite freely at present. It is quoted as follows, f.o.b. different important Canadian centres, the lower rates obtaining where water transportation is available (the price per bag is given, exclusive of cost of package): Montreal, $1.40; Toronto, $1.60; Fort William, $1.50; Winnipeg, $2.20; Calgary, $2.60; Ottawa, $1.40; Halifax, $1.50.

City's Building Progress

The building permits issued from Inspector Chausse's office during May, 1910, are well in advance of those taken out in May, 1909, the figures being respectively $1,703,200 and $1,269,504, an increase of $433,696. The figures for the first five months of the year show an approximate increase of 48 per cent. over the same period in 1909.

Comparing May with the preceding month of April, we note a slight falling off in number and value of permits issued for both new work and alterations. During April, however, permits for large work, such as the A. E. Rea & Company additions, National Breweries, Catholic Seminary, new building for the Guaranteed Pure Milk Company, two large Protestant schools and extensive building for Institute de Petite Fils were taken out.

To date this year, while a substantial gain has been recorded, it must not be overlooked that there are several large permits which in the ordinary course of events will shortly be taken out. Included among these may be noted the Windsor Station, Dominion Express building, Place Viger Hotel extension, Ritz Hotel, art museum and Yorkshire building (since taken out).

June is generally a good month in building circles and Mr. Chausse anticipates a steady patronage of his department.

Additions to City Hall Planned

With the annexation of eight new municipalities which occurred recently, the present City Hall is deemed entirely inadequate by the Board of Control for the transaction of the city business and Inspector Chausse has been asked to make an exhaustive report outlining the steps that should be taken to increase the present capacity. In all probability the Government's permission will be obtained for the use of a portion of the Champ de Mars for the erection of a new building to cost in the neighborhood of $500,000.

The new wards added to the city will be known as follows: Notre Dame de Grace, St. Paul, Ahunstic, Emard, Longue Pointe, Bordeaux, Cote des Neiges and Rosemount.

Standard Ideal in New Offices

The Standard Ideal Company, Limited, have opened show rooms at 155 Notre Dame street west. The new quarters are finished with dark oak panelling and blue burlap. The offices are located in a gallery at the back with the same style of panelling continued and brown burlap replacing the blue used in show room. Mr. J. J. Laferme is sales manager for Montreal and district.

Elevator Construction Commenced

The excavation work on the new 2,000,000 bushel capacity grain elevator has been placed well under way by the Harbor Commissioners. The new structure is being erected opposite Bonsecours Market, between the Jacques Cartier and Victoria piers.

For excavation, a Browning locomotive crane, with grab bucket attachment, is being employed and also a floating derrick equipped with orange peel bucket. The foundations will be of reinforced concrete and will be carried down to solid rock.

The elevator plans are being prepared by the John S. Metcalf Company, of Montreal and Chicago, acting in conjunction with Chief Engineer Cowie of the Harbor Board.

New Marble Quarry Company

The Dominion Marble Company, which was organized some time ago, are making active preparations to develop their marble quarries and to place their product on the market. The company's property is located in the vicinity of South Stukely, Que., about 70 miles south of Montreal, and the test cores taken out have compared very favorably with the highest class of Vermont marble, and it is supposed, in fact, that the deposit is really a continuation of the Vermont marble.

The plant is being installed and the location of the finishing mill will shortly be selected. There is also about one mile of railroad to be constructed into South Stukely to give the necessary railway connection. The company anticipate that within two months they will be able to market marble blocks in the rough.

Mr. Harry Brown, late of the Missisquoi Marble Company, is superintendent of the quarry, with Mr. A. E. Carr, for 22 years superintendent of the Barney Marble Company, Swanton, Vt., in charge of mill operations.

The officers of the company are as follows: President, Mr. R. T. Hopper; Vice-president, Mr. C. J. McQuaig; Secretary-treasurer, Mr. F. A. Johnson, of the J. C. McLaren Belting Company, Montreal.

President of A. C. Leslie & Company Banquetted

The Place Viger Hotel was recently the scene of a complimentary banquet tendered by the officers and staff of A. C. Leslie & Company, Limited, to their president, Mr. William Strachan Leslie, on the occasion of his approaching marriage. After the dinner, Mr. George B. Ball, western representative of the company, from Toronto, was called upon to propose the health of the guest of the evening and to present him with a magnificent mahogany cabinet of solid silverware. Mr. Leslie expressed his heartiest thanks for the co-operation and assistance received from those under his direction. After the various conventional toasts had been duly honored, "The Firm" was proposed by Mr. W. T. Cox, who spoke of the high regard in which A. C. Leslie & Company, Limited, were held by all those having dealings with them throughout the Dominion. Mr. E. H. Copeland responded with a brief sketch of the firm since its establishment by the late Mr. A. C. Leslie in the year 1866. The chairman then presented Mr. Leslie with a very handsome silver salver on behalf of Messrs. John Lysaght, Limited, of Bristol, England, who have been represented in Canada by A. C. Leslie & Company, Limited, for a great many years. The toasts were interspersed with vocal and instrumental music.

Creed and Contract Matters

London, Ont., June 8th, 1910.

Editor, "Contract Record":

At a meeting of the London Builders' Exchange held last week, the attention of the members was directed to an article published in the "Contract Record" of May 18th, in which it was stated that creed had been a consideration in awarding the contract for a public school in the city of Ottawa.

Your valuable journal took a decided stand against countenancing any such practices, and criticized the action of the trustees very severely for passing by the lowest tender on the ground that one of the members of the firm submitting it was not a public school supporter. Taking it for granted that the facts are as represented in your journal, the members of this exchange instructed the secretary to inform you that they are heartily in accord with the stand you have taken on this question, and they desire to express the hope that the "Contract Record" will continue to be a public educator and vigorously denounce all such dishonorable actions that are brought to its notice. Further, they are of the opinion that a continuance of such methods as those under discussion will hasten the time when those who are asked for tenders will have to be compensated for their time and trouble in figuring.

Appreciating very fully your efforts to improve the conditions of contracting,

Yours very gratefully,

GEORGE S. GOULD,

Secretary London Builders' Exchange.

The foundation for the new pier recently built on the north side of the mouth of the River Tyne, England, is 26 feet below the foundation of the old pier, to which it is joined. There is, therefore, a high step from one foundation to the other, and in order to prevent settlement of the old structure a barrier was constructed across the end where the new one was to start. This acted as a retaining wall to prevent displacement of the large boulders and sand on which the old pier is built. The barrier consisted of eight steel cylinders, each 13 feet in diameter, sunk under compressed air into the shale on which the new pier was to be founded. They were sunk as closely together as possible in a line across the pier site, and when down to a sufficient lepth were filled with concrete. The angles between the cylinders were filled with jarrah timber piles. In sinking the cylinders a cast iron inner lining leaving an annular space between it and the cylinder was used. This space was filled with concrete, in order to weight the cylinder and also to act as reinforcing during sinking. The lining was removed before the tube was filled with concrete, and in order to facilitate the removal the rings were made of bolted sections and had a removable key piece.

The head offices of the Ontario Iron & Steel Company and the Page-Hersey Tube Works will be removed from Toronto to Welland, where a fine brick office building is in course of construction.

Personal News and Notes

The Montreal City Council has voted a million and a quarter dollars for paving work.

Mr. Geo. W. Evans, C.E., of the Transcontinental staff at Quebec, Que., is now located at Red Deer, Alta.

The Saskatoon, Sask., plumbers have gone on strike for an increase of 5 cents an hour, from 50 to 55 cents.

Mr. W. W. Northcott, purchasing agent at Victoria, B.C., has also been appointed superintendent of public buildings for that city.

Mr. H. R. Rindal, late of Winnipeg, has been appointed chief engineer of the Pacific division of the C.P.R., vice Mr. C. E. Cartwright, resigned.

Mr. J. D. Whitmore, consulting engineer, Regina, Sask., has been engaged to plan the installation of a sewerage, water works and other plant for the town of Melville, Sask.

Mr. McGillivray, Government Good Roads Commissioner for Manitoba, has returned to Winnipeg after a trip through the province, undertaken with a view to inspecting the existing highways.

It is interesting to note that the ships required for the new Canadian navy will be built by contract. It is stated that tenders for the vessels will probably be taken next September or October.

One of the new Municipal Commissioners at Regina, Sask., is Mr. A. J. McPherson, who for some time has been consulting engineer to the city. Mr. McPherson's appointment is worth $6,000 a year.

Mr. W. M. Davis, town engineer of Berlin, Ont., has been appointed city engineer for Prince Rupert, B.C., at a salary of $5,000 per year. Fourteen applications were received. The salaries asked ranged from $900 to $6,000.

Mr. A. S. Blizzard, a prominent British business man now visiting Canada, spent several days in Toronto recently. He had previously visited Montreal, Ottawa, St. John and Halifax, and intends before returning to see this country from coast to coast. Mr. Blizzard is making arrangements for representation here of the well known Woolliscroft firm, of which he is managing director. They are large manufacturers of tiles, terra cotta, etc., and expect to work up a large market here. The visitor is greatly impressed with Canada.

Handy Reference Book for Contractors

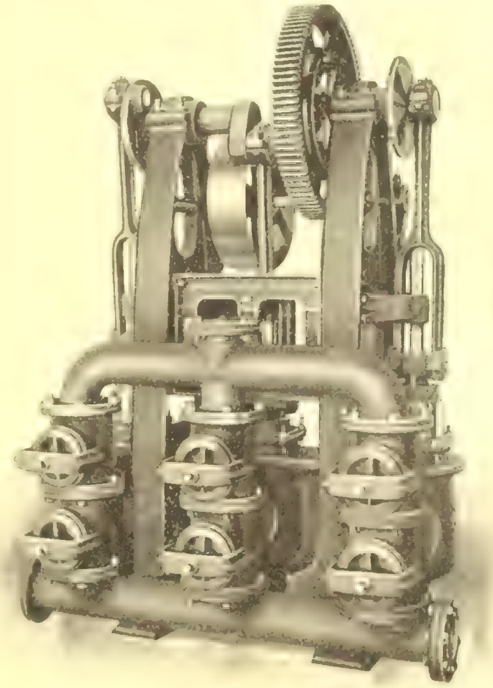
The Canadian Fairbanks Company, Limited, have just completed their general catalogue, which will be ready for distribution July 1. The catalogue is a very artistic production and should prove of general interest to every manufacturer and purchasing agent throughout Canada. It is profusely illustrated and shows the many and varied lines handled by the company. The catalogue is divided into the following sections: Fairbanks scales; electrical apparatus and supplies; pumps, steam, belt and gasoline; valves and steam goods; railway and contractors' supplies; small tools and supplies; power transmission appliances; safes, vaults, and metal office furniture.

In addition to the general catalogue, small sectional catalogues as listed above are being issued. The general catalogue consists of approximately 1,200 pages. A heavy coated paper is used in both the general and sectional catalogue, so that all engravings are shown up to best advantage. The general catalogue is bound in cloth covers, the sectionals in heavy cover stock, richly embossed. Neither time nor expense has been considered in preparing this catalogue, and it is with a great deal of satisfaction that we now present it for your consideration.

As a reference book it will prove of very great value in every manufacturing plant and a glance through its pages will bring to mind very strongly the position being filled by the Canadian Fairbanks Company, Limited, as Canadian distributors. Copies of this catalogue will be mailed free upon application.

Improved Design in Pumps

The accompanying cut illustrates a single acting triplex stuff pump, built by the Smart-Turner Machine Company, Limited, Hamilton. They have supplied a number of these pumps to paper mills. The pumps are designed so as to give ready access to all valves, cylinders and working parts. The plungers are outside guided and outside packed. The pump is brass fitted throughout, and provided with bronze ball valves, on bronze valve seats, which are held between the flanges of the valve boxes. There are no corners or pockets in which the stock may lodge. Gears and pinions are cut from the solid, and connecting rods and crank shafts are of steel. The pump is built in a careful and substantial manner.



Up-to-date Pump Manufactured by The Smart-Turner Machine Co., Ltd., Hamilton, Ont.

Choloride of Calcium in Concrete Mixtures

One of our friends in the builders' supply business asks us the following question and, as it is one of vital importance, we are answering it so that other dealers, and, in fact, anyone engaged in the building material business may have the benefit of our advice, says "Rock Products":

"What effect upon the strength of concrete has a mixture of ten to twenty per cent. chloride of calcium by weight of water? Also, will it cause the concrete to chip?"

The effect of calcium chloride on cement mixtures is practically of recent demonstration, consequently a great deal remains in theory which must be put on a practical basis. It seems to be the general consensus of opinion among those who are familiar with this compound and its peculiarities, that a two or three per cent. solution is ample to give the desired results and far enough within bounds to prove of safety. Percentages ranging above ten would give highly saturated solutions having the probable tendency to rapidly shorten the initial setting time of the cement and directly interfere with its perfect crystallization. Naturally this would seriously decrease the original strength of the concrete with after effects which might altogether disrupt the bond. Later, its inclination to redissolve in the presence of moisture might cause the disintegration of the cement surface, penetrating deeper and deeper until the structure, in time, was pretty well destroyed.

The effect of chloride of calcium is somewhat analagous to common salt, technically known as sodium chloride, frequently used in concrete mixtures to prevent freezing. A two per cent. solution of calcium chloride will perceptibly retard the setting of the cement and will lower its freezing temperature to a point where for all ordinary purposes concrete structures can be erected in extremely cold weather without the accompanying bad effects so common to the majority of cases where special precaution is not exercised. In any event, care should be taken to protect the green concrete from frost by resorting to the usual methods of covering with straw, etc.

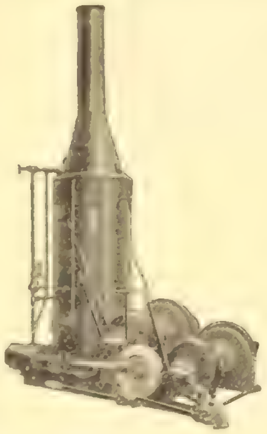
We doubt if high percentage of calcium chloride would cause the cement to chip. It would have rather the opposite effect; that is, slow disintegration. This is a subject, however, that will command further investigation and we hope to have more exhaustive data at hand in the near future.

Novel Method of Laying Rails in Reinforced Concrete

The "Electric Railway Journal" says that Dr. M. Eisig, manager of the Chemnitz, Germany, municipal street railway system, has recently designed a novel construction for rigidly anchoring in a reinforced concrete base rails laid in paved streets. The anchorage consists of iron rods ¾-inch to 1¼-inch in diameter and from 20 inches to 24 inches long passing through the web or the base of the rail from 6 inches to 8 inches apart and embedded in the concrete girder which surrounds the rail below the head. These rods are securely fastened to the rail by conical channel pins and are bent down at the ends to secure a firm hold in the concrete. The rods not only tie the rail to the concrete, but also serve as lateral reinforcement in the concrete beam. Additional reinforcement can be used by placing longitudinal rods in the concrete beam parallel to the rail and tying the two sets of rods together with wires at the points of intersection. The resistance to lateral motion of the rail under this construction is increased by inserting the transverse rods through the web of the rail close under the head. The distance between the top of the head of the rail and the centre line of these rods depends on the depth of the paving and the thickness of the layer of concrete above the rods. The adhesion of the concrete to the rail and the rigidly attached reinforcing rods prevent any movement of the rail relative to the concrete beam, and thus there is no grinding or pulverizing due to the rail working loose under vibration.

Building permits at Regina, Sask., for the month of May totalled $392,975, bringing the total for the first five months of the present year up to $967,670, $200,000 in excess of the whole of last year.

The prosperity of Winnipeg and the West this year is reflected strongly in the building returns for the month of May, and also the returns for the first five months of the year. For the first five months of this year the total is $7,428,900, or $1,807,200 over the previous best year in the city's history. The total amount for the month of May this year is $2,091,500. The number of permits issued in May was 497 for 597 buildings.



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The One Piece Frame and Bearings. No more shaky bearings from Bolts and Nuts working loose; much stronger, more rigid and neater than the old style Bolted Bearings.

The Interchangeable Drum Frictions. All our Wood Frictions now are positively interchangeable, made to template, and fitted and turned to exact standard so they can be attached to the drum on the spot, without sending the job to a machine shop.

Brake and Ratchet on BOTH Drums. Friction Thrust Screw parts working in Oil constantly. Levers and valves all within easy reach.

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"Water-washed" and Gravel

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A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

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This cut shows some of our large staved columns. We are especially well equipped for the manufacture of these columns and are in a position to make columns of any desired diameter and length.

BATTS LIMITED

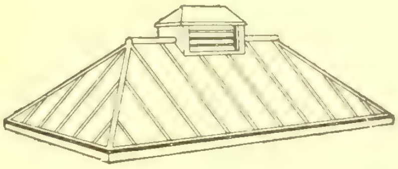
Manufacturers **West Toronto**

"A work ill done must be twice done—only the best gives satisfaction."

—The Philosopher of Metal Town.

Metallic Skylights

Are Practically Imperishable



The framework is of hollow metal, galvanized steel or sheet copper and when glazed with **wire glass** is **absolutely fireproof.** We make all shapes and sizes.

The exclusive features of "Metallic" Skylights make for permanency and absolute satisfaction. See that they are specified in contracts.

Information and prices on request.

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The Metallic Roofing Co Limited
TORONTO & WINNIPEG

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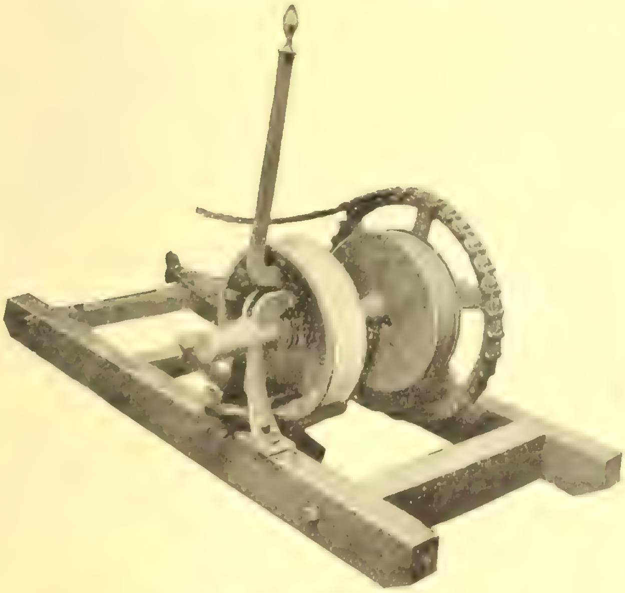

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Contractor's Work **Mortar Conveying** **Well Digging**
Bridge Building **Sewer Building** **Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

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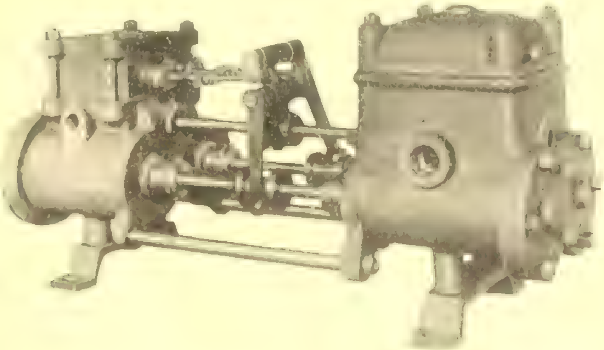
Engineers and Machinists London, Canada

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co.
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Fine Interior and Exterior Woodwork

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Among our lines are high-class Hardwood Flooring, Sashes, Doors, etc. Be sure to get our prices on these goods. :: ::

We make everything in Church Furniture.

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to use an inferior brand of plaster. A plaster that shrinks or falls off—the curse of modern building trades.

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It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

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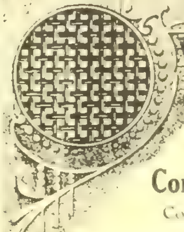

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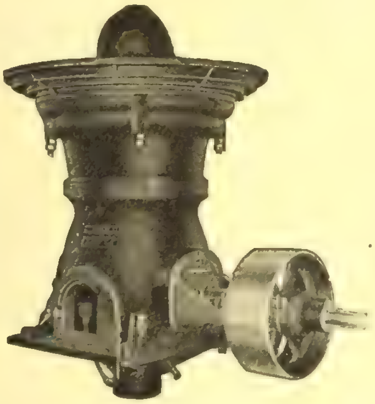

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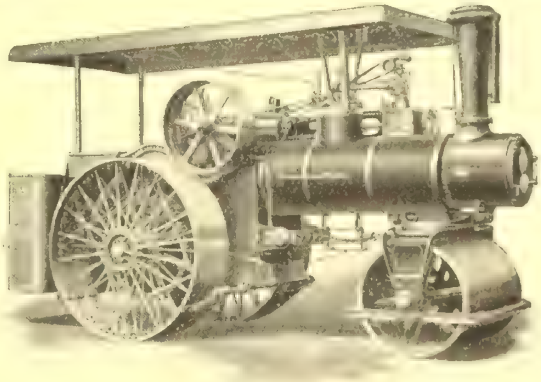

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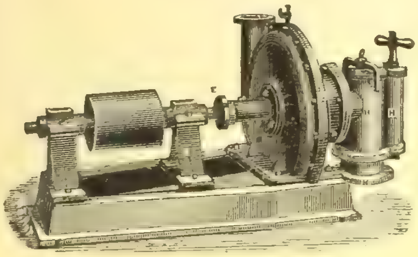

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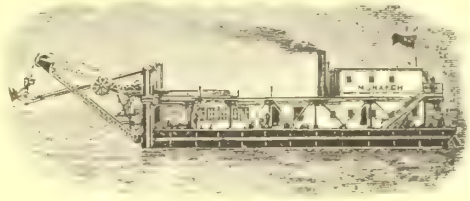

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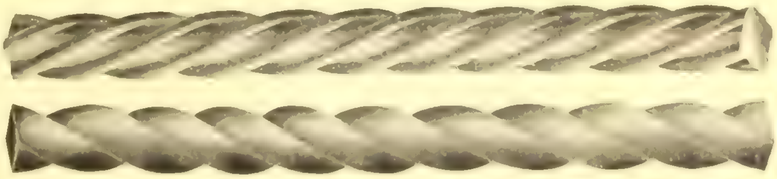

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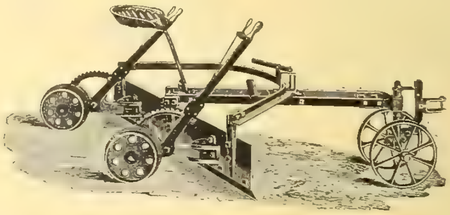

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Red Deer, Alta.
April 15th, 1910

"I enclose herewith cheque to cover grader. I may say that we have used the machine for several days on our streets and it is the machine we have long needed for keeping the roads and ditches in repair. We are well pleased with it and I am sure that when some of the councillors for Local Improvement Districts see it work they will get some. We use a plow on the side of the road and throw up three or four furrows, then use the machine and grade to the centre, afterwards going over and picking up loose stones. We use the town team and they handle it without difficulty."

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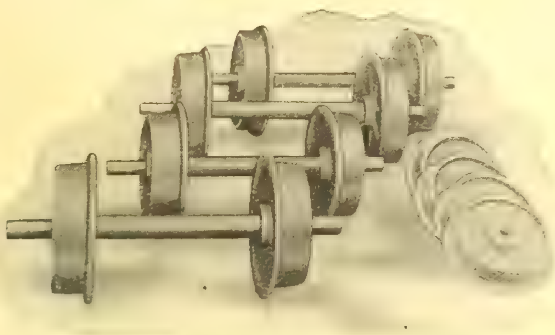

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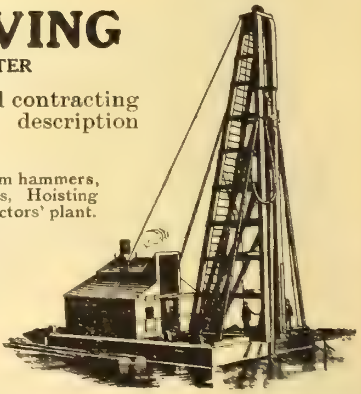

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	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	12.00
Grey stock bricks	10.00
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Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from ..... $80.00 to	$150.00

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Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D,D.
10 to 25 united inches	$4.25	$ 6,25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i,	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	.,..	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

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Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex, and 3-16 inch round, 58 cents per square foot up.
Floor Tile—½-inch square 65 cents.
Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to color 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, firsts 70 cents.
Capping Coves and corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.

Boilers—Galvanized Iron Range,

30-gallon, standard, $4,50; extra heavy, $7.00.

CastIron Sinks.

16 x 24. $1.00; 18 x 30. $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

7 and 8-inch pipe, 40 per cent.
Light pipe 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL. Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b, Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto,
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3,50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per thousand.
Steel channels and beams, $2.75 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents,
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $10.50; sanded $5.50;; universal finish, $15.50.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $7.50 to $8.00 to $9.00 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs,
Boiled Linseed Oil, in barrels, 95 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 92 cents per gallon of 9 lbs.
Turpentine, in barrels, 85 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Dobell, Beckett & Company, wholesale lumber dealers, Quebec, Que., are stated to have dissolved.

Falstrault & Landriville, sash and door manufacturers, Longue Point, Que., are stated to have dissolved.

The Silica Sand Company, Montreal, Que., are stated to have dissolved. Malcolm Gregory, registered.

The B. C. Gazette gives notice of the incorporation of the following companies:— E. C. Atkins & Company, capital, $600,000, incorporated to carry on the business of saw manufacturers, machinery, tools, etc.; A. C. Frost Company, incorporated to construct logging railways, electrical works, tunnels, etc.; Wendle Hydraulic Company, Limited, capital $100,000; Pacific Province Power Company, Limited, capital $100,000; Modern Construction Company, Limited, capital $[illegible] 000.

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SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
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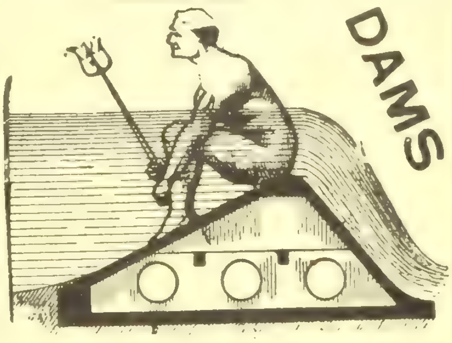
Head Office: INGERSOLL, ONT.



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		1905—1906		1905—1909
MEXICO CITY		**120,000** bbls.	**U.S. PHILIPPINE GOVMT.**	**40,000** bbls.
NECAXA DAM	(shipping instructions so far 60,000 bbls.) approximate amount	**175,000** bbls	**GOVMT. ORDER SOUTH AMERICA**	**150,000** bbls.
XOCHIMILCO WATER WKS., MEX.	approximate	**200,000** bbls.	**RIO DE JANEIRO, SATOS, ETC.**	**40,000** bbls.

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There is always a certain trade who will pay for the best. We also make American Alsen, the highest grade of domestic Portland cement.

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We have just equipped our Hardwood Flooring Plant with the most modern machinery and are now in position to fill orders with the greatest promptness.

Our flooring is thoroughly **air-seasoned** and **kiln-dried, end-matched,** and **bundled.**

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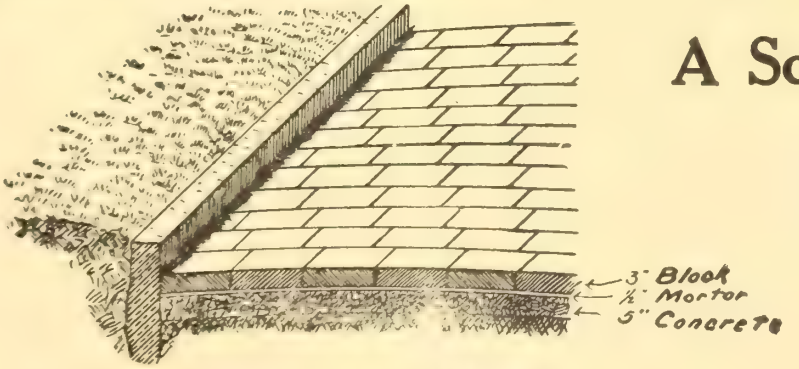

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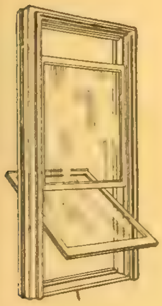

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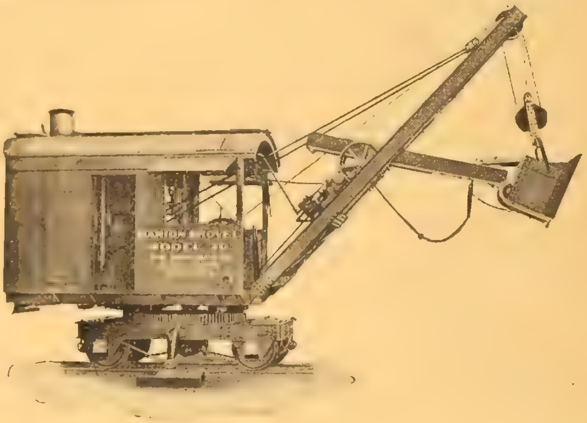
Especially designed for Excavations, Brick Yards and other light work or in cuttings where the material can be handled more economically by means of cars of about 1½ yard capacity, drawn by horses.



Manufactured in two sizes—¾ cubic yard and 1¼ cubic yard. These shovels are built along the lines in point of material, workmanship and design as the Marion large size shovels.

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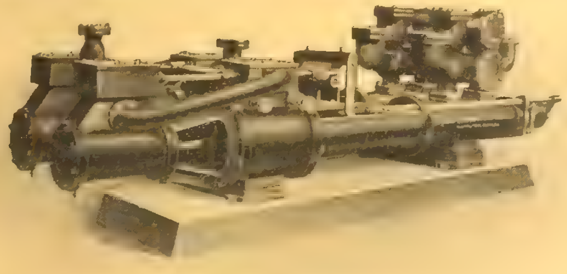

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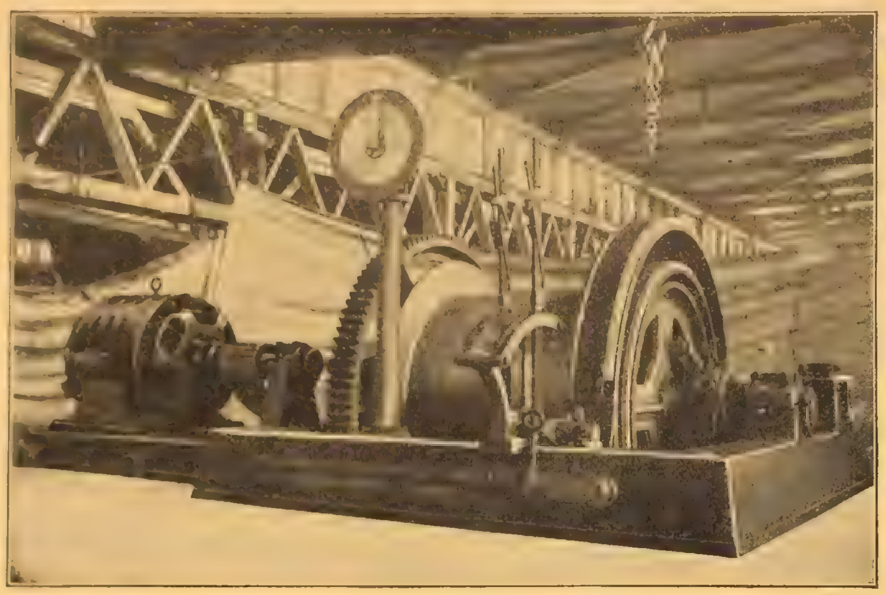

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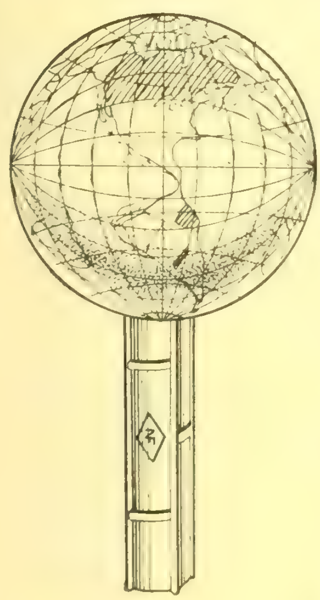

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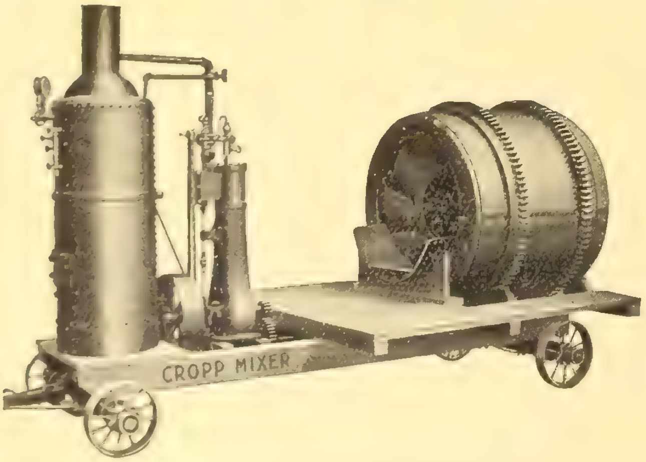
Cropp Mixer



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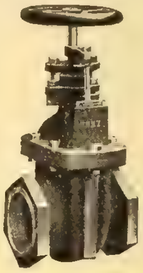

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Galvanized Wire Wound &
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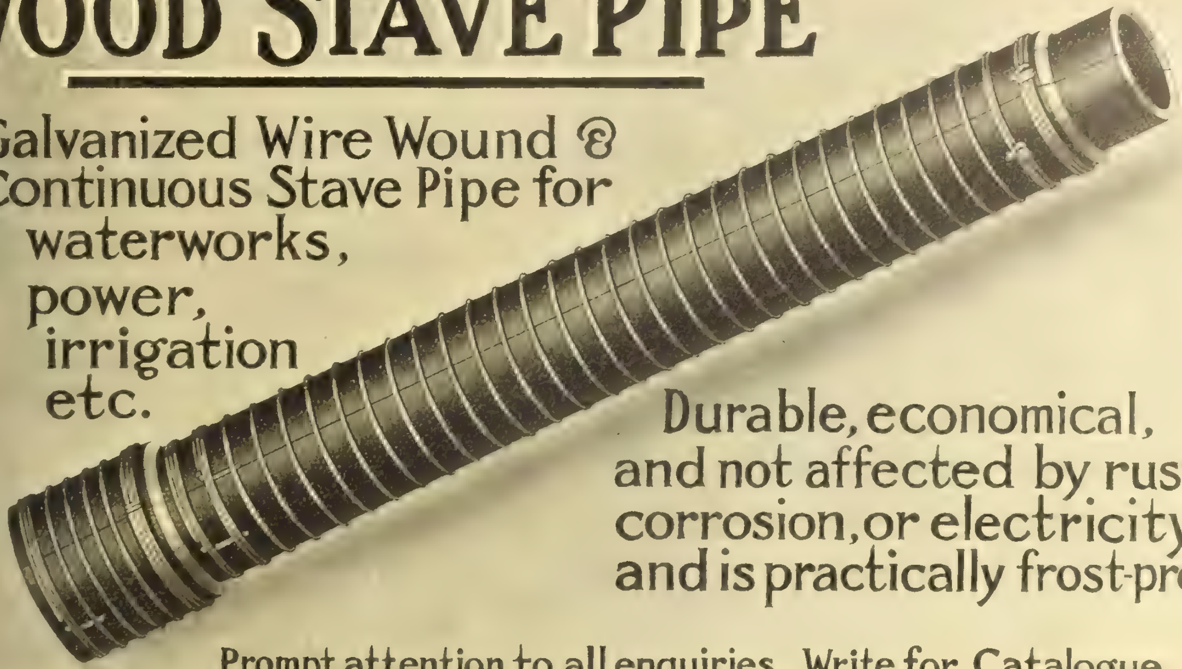

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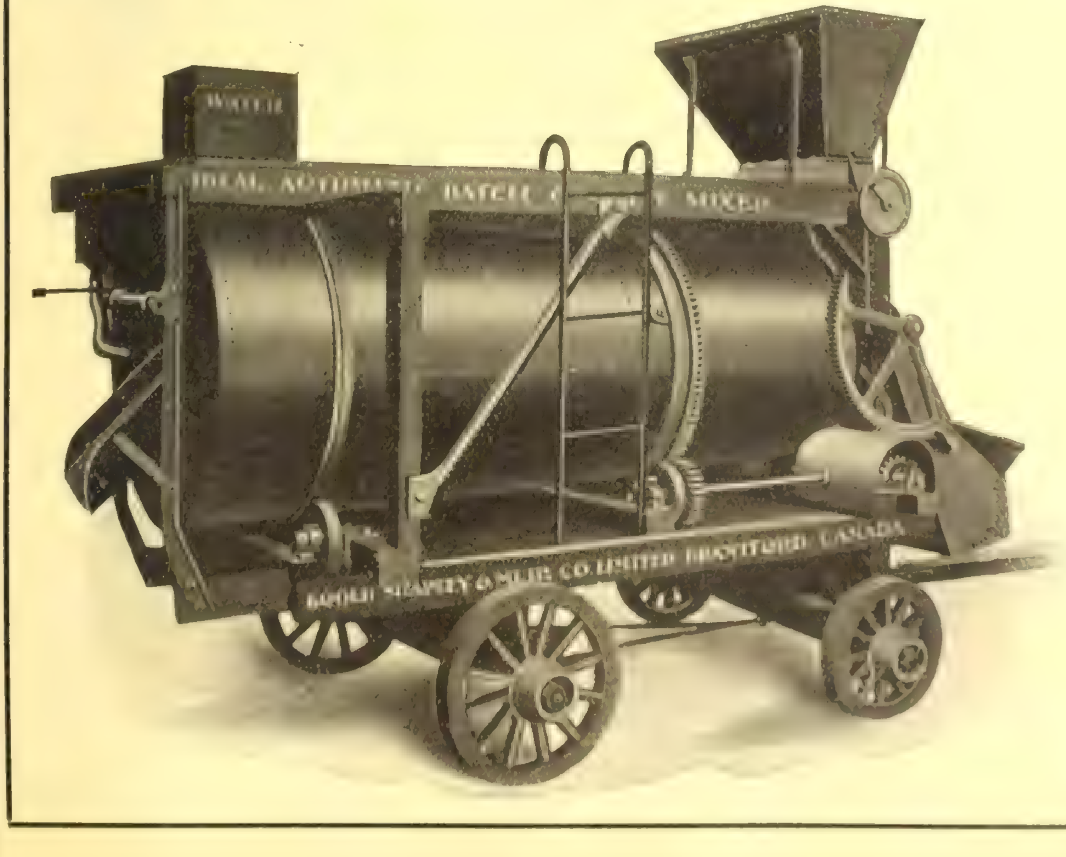
Brantford "Automatic" Batch Concrete Mixer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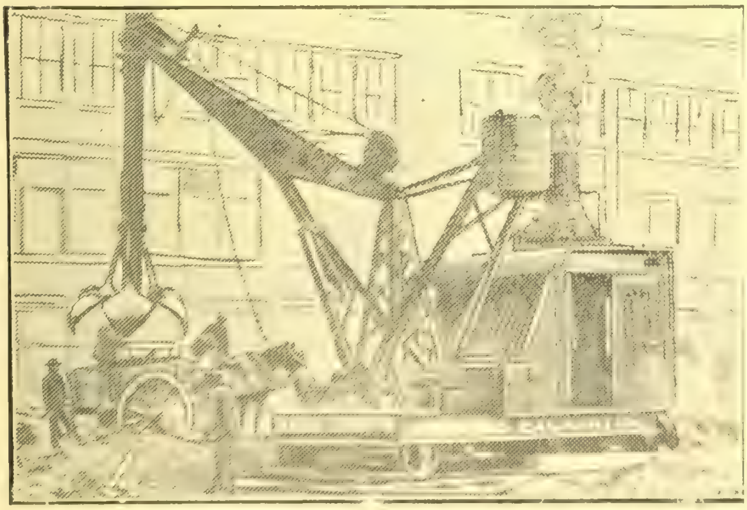

is that this machine will work under its own level to any depth down to 30 feet and to any width from 2 to 40 feet. It will work in any kind of material except hard pan.

No Contractor should be without it.

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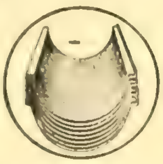

This compactness saves freight and makes it easy to handle them. You put the sections together like this:

Then you clamp the flanges together like this:

And you've got a piping that will outlast anything of the kind there is. Better get the book and sample and study it.

G. H. Pedlar

GET your township reeve or warden to study Pedlar Culverts. Send for the Free Book and show him why this Culvert surpasses for all ditch drainage, for restraining small streams, for every use that any culvert can serve. You will profit through lowered taxes, better roads and abolished washouts. Send for the book and interest your township's officials. You will benefit by what they will learn.

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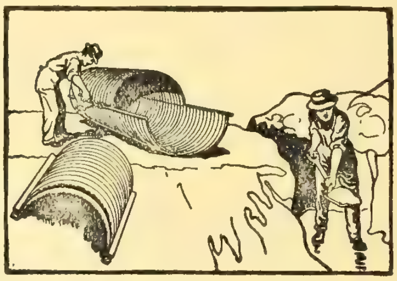
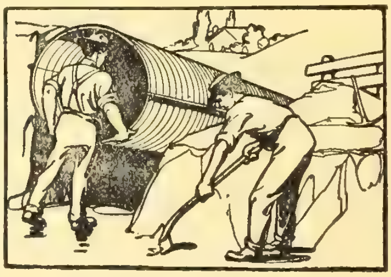


A few hours' work—no special skill needed—and an indestructible culvert is in place ready for use.



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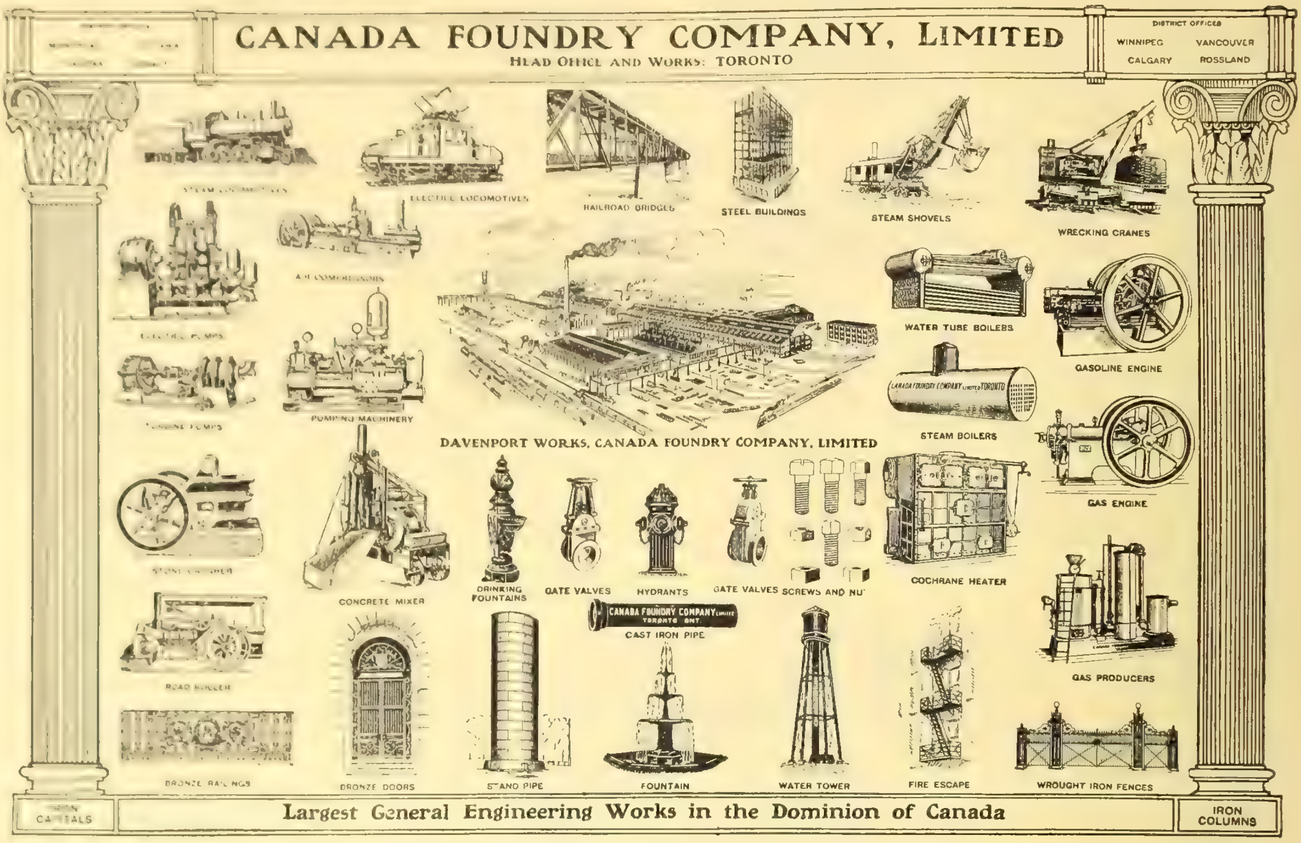

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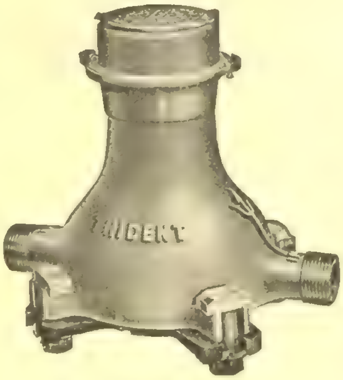

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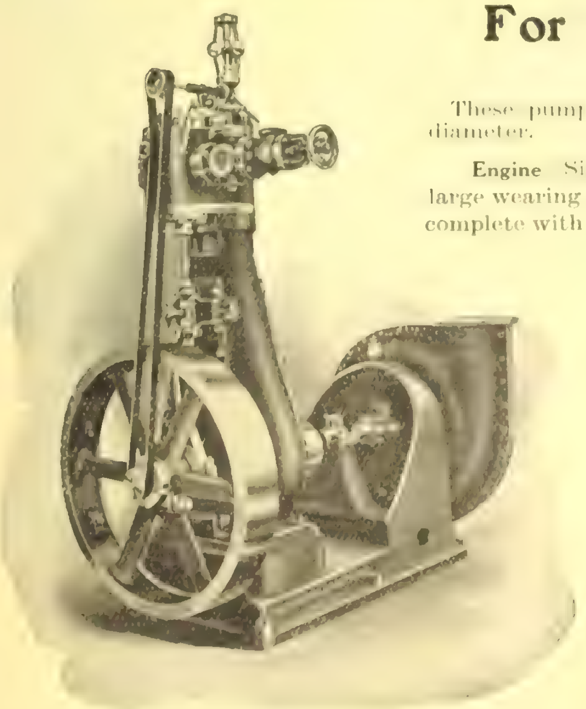

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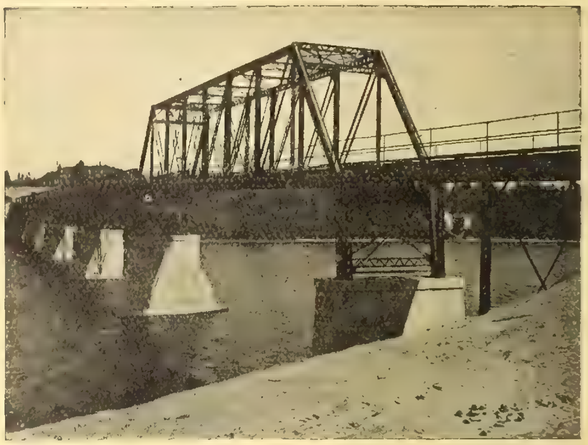

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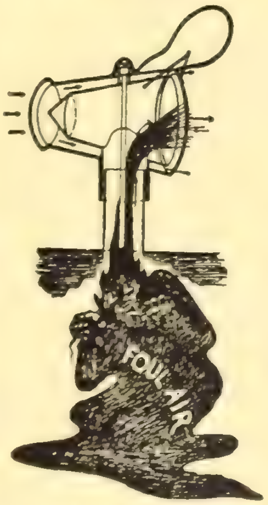

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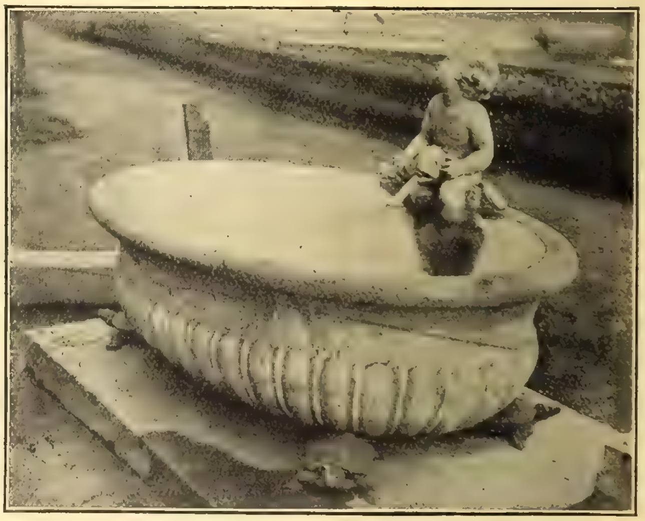

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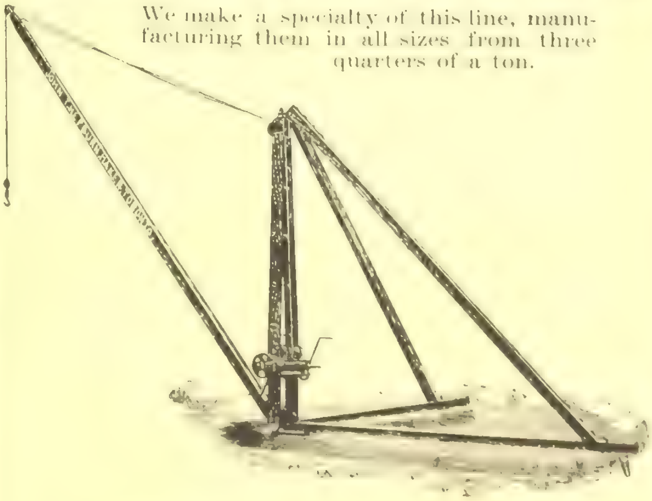

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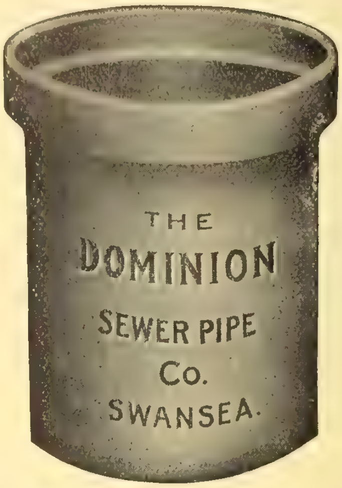

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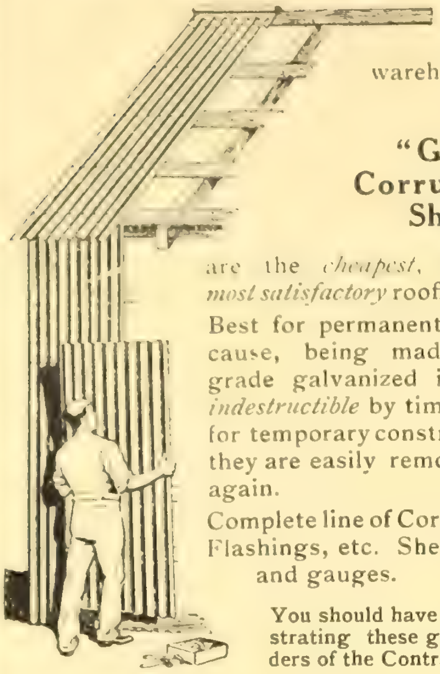

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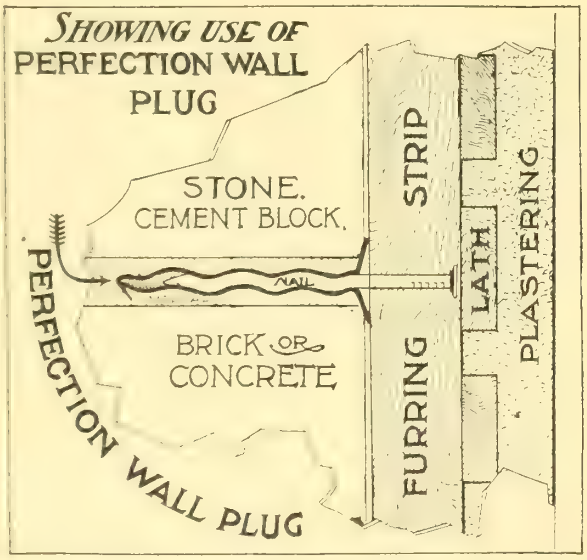

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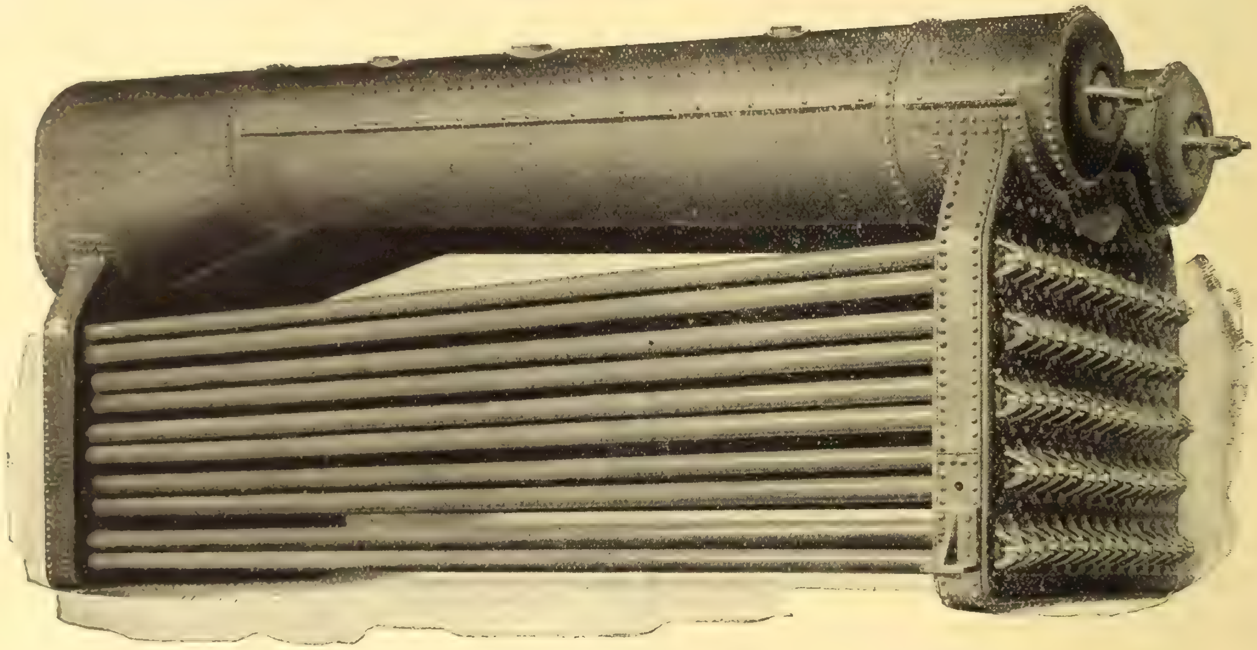

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Brantford, Ont.

Tenders will be called for pavement on Lorne Crescent, Darling street, from George to Market street, and Park avenue, from Arthur to Colborne.

Chilliwack, B.C.

A scheme involving $10,000 is on foot to dredge a channel along the foot of the Chilliwack mountain to a junction with the Fraser river.

Collingwood, Ont.

Tenders addressed to K. S. Macdonell, town engineer, will be received until June 24th for construction of brick-paved roadway on Hurontario street.

Tenders addressed to K. S. Macdonell, town engineer, will be received until June 24th for construction of sewer on Fifth street. Plans, etc., at office of the above.

Dunnville, Ont.

Tenders will be received by J. W. Holmes, town clerk, until June 28th for the completion of a system of sanitary sewers which have been partly constructed. For further particulars see "Tenders and For Sale Department" this issue.

Humberstone, Ont.

Tenders addressed to H. J. Knoll, reeve, will be received until July 31st for the work known as Lyons Creek Drain, etc. Plans, etc., at office of G. Ross, C.E., Welland, or at the office of the above.

Ladysmith, B.C.

The council has passed a bylaw to raise $25,000 to improve its waterworks system.

Lindsay, Ont.

The town of Lindsay are calling for tenders for the construction of approximately 6,950 square yards of bituminous pavements. Tenders close June 27th. For further particulars see "Tenders and For Sale Department" this issue.

Moncton, N.B.

This municipality is considering the advisability of boring artesian wells in order to increase the water supply.

Moose Jaw, Sask.

Tenders are being called by this municipality for supplying material and constructing sewage disposal plant, etc. For further information see advertisement in "Tenders and For Sale Department" of this issue.

North Bay, Ont.

Tenders will be received until July 2nd for furnishing materials and construction of approximately 60,000 square yards of concrete sidewalk. M. W. Flannery, town clerk. For further particulars see "Tenders and For Sale Department" of this issue.

Ottawa, Ont.

On the recommendation of Mr. A. Hazen, the New York expert, surveys will be made as to the cost of bringing water supply from McGregor's Lake to the city.

Outremont, Que.

Tenders are being called for laying of cement sidewalk, etc. For further information see advertisement in this issue.

Point Grey, B.C.

A $20,000 pavements by-law will shortly be submitted to the ratepayers.

Stoney Creek, Ont.

Tenders addressed to Erland Lee, township clerk, will be received until June 25th for all excavation required to complete the Saltfleet Swamp Drain. Plans, etc., at office of the above or at that of Tyrell & McKay, Hamilton.

St. John, N.B.

Tenders are invited until June 28th for paving, etc. W. Murdoch, city engineer. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

Swift Current, Sask.

Tenders addressed to G. W. Bilbrough, secretary-treasurer, will be received until July 12th for the supply of hydrants, valves, etc.; sewer tile; and cast iron water mains. J. Darlington Whitmore, engineer; Regina; A. W. Snider, mayor.

Sydney, N.S.

Tenders addressed to J. J. Curry, city clerk, will be received until June 29th for the construction of sewer extensions. Plans, etc., at office of City Engineer.

Thamesville, Ont.

Until July 4th $10,000 30-year, 4 per cent. waterworks debentures will be received. W. J. Cryderman, clerk.

Tenders are being called until June 24th for supply of gravel, cement, and construction of cement basin and laying of pipe lines, etc. W. J. Cryderman, clerk.

Toronto, Ont.

Only one tender was received for the pumping station at Sunnyside, being $7,353. Engineer's estimate, $3,800. Work will be done by day labor.

Tenders addressed to G. R. Geary, chairman Board of Control, will be received until June 28th for wooden patterns for special castings for water works purposes. Specifications at office of City Engineer.

The tenders received for construction of asphalt block pavement on College street, between Manning avenue and Dovercourt road were as follows per bulk sum: First Tendering—(1) [illegible]; (2) [illegible]; (3) $49,950; (4) $48,497; (5) City Engineer, $50,052. Second Tendering—(1) $42,506; (2) $42,486; (3) $27,000 (heavy sheet asphalt); (4) (City Engineer) $50,052. No award has yet been given owing to the ratepayers being divided as to kind of pavement.

Victoria, B.C.

Tenders for the construction of permanent [illegible] on portions of Maple, [illegible] were received from the following: City engineer, $19,707.21; A. Pike, $18,015.40; F. Stedman, $17,532.

Winnipeg, Man.

Tenders are being called by the Board of Control until June 28th for construction of sewer connections and installation of plumbing, etc. M. Peterson, secretary.

AWARDED.

Cobourg, Ont.

D. H. Minaker, town clerk, writes that the contract for cement walks has been awarded to Jex & Company, Cobourg, at 9 7-8 cents per square foot. The Forest City Paving & Construction, London, also tendered at 9.90 cents per square foot.

Fernie, B.C.

G. H. Boulton, city clerk, writes that the contract for the construction of storm sewers was let to J. J. Wood, contractor, Fernie.

Halifax, N.S.

Tenders for furnishing 10,000 feet of six-inch water pipe were received as follows: H. A. Drury & Company, Montreal, $31.65 per ton of 2,000 pounds, delivered; Gaudry & Company, Quebec, $31.90; Wm. Stairs, Son & Morrow, $31.20, delivered at Halifax, or $30.20 at New Glasgow; Messrs. Hankin, Montreal, $29.80 delivered; W. B. Robinson, Montreal, $29.20; R. D. Wood & Company, Philadelphia, $21.50, f.o.b. cars at foundry, freight guaranteed $3.70, duty extra; D. Y. Stewart, Glasgow, $31.00. The tender of W. Beverley Robinson being the lowest was recommended for acceptance. Tenders for two 9-inch, fifty 6-inch and three 3-inch valves were opened as follows: H. A. Drury & Company, 9-inch, $29.20 each; 6-inch, $17.53; 3-inch, $10.23. McAvity & Son, St. John, 9-inch, $30; 6-inch, $10; 3-inch, $5. R. D. Wood & Company, Philadelphia, 9-inch, $19.10; 6-inch, $9.85; 3-inch $4.95. This tender called for the firm's own special make of valve and was therefore not considered. McAvity & Son's tender being the lowest was recommended for acceptance.

Montreal, Que.

The Structural Steel Company have been awarded the contract for the construction of an 80,000-gallon stand pipe for the municipality of Longueuil.

The Structural Steel Company, of Longue Point, have been awarded the contract for the construction of extensive penstocks for the Brampton Pulp & Paper Company, at East Angus, Que.

Niagara Falls, Ont.

Contracts have been let for the laying of the macadamized road between Niagara Falls and Bridgeburg. The total cost will be $95,000. Messrs. Cook & Menzie, of Niagara Falls, will build two sections, and H. Campaign, of Niagara Falls, the other half. The Niagara Falls Park Commission have charge of this work.

Prince Rupert, B.C.

S. P. McKord & Company, Victoria, have received a [illegible] contract at Prince Rupert. W. H. Mitchell & Company tendered [illegible]; S. H. Warren & Company, [illegible].

Renfrew, Ont.

We are informed that the contract for supply of [illegible] barrels Portland cement was awarded to F. J. McGarry at $1.75 per barrel, f.o.b. Renfrew, in paper sacks.

Toronto, Ont.

The Board of Control has awarded the contract for the pipe for the 500 foot extension of the waterworks intake pipe to the Canada Foundry Company.

Details of tender — 72 inch steel riveted pipe, per foot—500-foot lot, $19.98; 1,000 foot lot, $19.22, 1,500 foot lot, $19.00; bracket for present intake, $709; new intake branch, $1,481, 3 steel flexible joints, each $1,077.

John McGuire was awarded the contract for treated wood block pavement on Yonge street, King street to Front street, at $10,391. Other prices were, $11,599; $11,740; $11,341 and $12,537 (the city engineer's).

Tenders were awarded as follows for alterations to the main pumping station:—Carpentering, M. Hutchinson, $3,877; painting and glazing, Faircloth Company, $405; roofing, etc., Flowers & St. Leger, $660. Other prices were as follows: Carpentering, $3,249; painting and glazing, $405, $470; roofing, etc., $660.

Contracts for the construction of the following asphalt pavements were awarded as follows: Dresden avenue Carlaw avenue to Pape avenue, $2,368, the lowest; Galt avenue, Gerrard street to north end, Barber Asphalt Paving Company, $3,136, the lowest; Shaw street, Essex avenue to C. P. R. tracks, Godson Contracting Company, $8,663, the lowest. Contracts for bitulithic pavement on Delisle street, Yonge street to Deer Park Crescent, $6,684; and also Farnham avenue, etc., $2, 889 to City Engineer; Marmaduke street, Sunnyside avenue to Indian road, to the Warren Bituminous Paving Company, $2,345, the lowest. Other tenderers's prices respectively on above streets, were $6,900, $2,932 and $2,355, the City Engineers.

Vancouver, B.C.

The following bids were made on paving and cement walk contracts: M. P. Cotton's tenders in all cases being accepted: Campbell avenue, Hastings to Barnard: M. P. Cotton, $24.333; Palmer Bros. & Hanning, $29,225. Campbell avenue, Powell to Hastings, M. P. Cotton, $8,616; Palmer Bros. & Hanning, $10,200; Fourth avenue, $32,000; T. R. Nixon, $34,000; Palmer Bros. & Hanning, $35,453. Granville street: M. P. Cotton, $32,000; T. R. Nixon, $33,000; Palmer Bros. & Hanning, $36,500. A. Morrison secured the grading on Sixteenth avenue from Bridge street to Oak at $6,515, this work to be subject to the approval of the Point Grey Council. Palmer Bros. & Hanning's bid on this was $9,063.

Walkerville, Ont.

C. H. Robinson, Clerk, sends us the following list of tenders for granolithic walk, etc., as per square foot: Thos. Chick, Windsor, 9½ cents; D. Todd, Windsor, 9 7-8 cents; Cadwell Silex Stone Company, 9 cents (accepted).

Weyburn, Sask.

Frank Rooney secured the contract to construct the waterworks power house and pumping station. McKenzie & Prevost, Estevan, also tendered.

Railroads, Bridges and Wharves

Berlin, Ont.

Tenders addressed to A. N. Warfield, are called until July 15th, for clearing and grading of 29 miles of railroad; also for material and equipment, etc.

Chatham, Ont.

Tenders addressed to J. Gosnell, county clerk, will be received until June 30th for putting concrete floor on south approach to Kent Bridge. Plans, etc., at county clerk's office, this place. Jas. Bell, C.E., St. Thomas.

Elder's Bridge, Ont.

Tenders will be received up to June 27th by Barber & Young, engineers, Adelaide street, Toronto, for the construction of concrete aboutments and reinforced concrete truss bridge over the Humber river. For further particulars see "Tenders and For Sale Department" of this issue.

Harriston, Ont.

Tenders addressed to W. D. McLellan, clerk of Minto, will be received until June 24th for concrete work required in the erection of five bridges. See advertisement in "Tenders and For Sale Department."

Halifax, N.S.

A charter has been granted to a company represented by J. B. Bartram, of Toronto, barrister; Thos. B. Fogg, of Toledo, Ohio, railway manager; G. H. Raw and S. Hirsch, of London, Eng. They will proceed to construct the railway east of Halifax, from Dartmouth to Guysboro and from New Glasgow to Country Harbor in the near future.

Lunenburg N.S.

Tenders are being called by the Public Works Department, Ottawa, for Little Tancook Island Breakwater until July 4th. Plans at offices of the district engineers at Halifax, Antigonish and on application to local postmaster.

Montreal, Que.

Tenders were received by the Harbor Commisisoners up to 17th June for steel girders, span crossings for high level tracks.

New Richmond, Que.

Tenders will be received until July 11th for extension of wharf. R. C. Desrochers, Assistant Secretary, Department of Public Works, Ottawa.

Ottawa, Ont.

The Department of Railways are issuing a call for tenders for a bridge over the Saskatchewan river at The Pas. Tenders must be in by July 4th.

AWARDED.

Fort William, Ont.

The works committee awarded to Stewart & Hewitson contracts for the rock whic art & Hewitson contracts for the rock which will be used in the new Neebing river bridge.

Montreal Que.

The Foundation Company, Limited, have been awarded the contract for the construction of concrete piers for the new C. P. R. bridge at Lachine.

Toronto, Ont.

The contract for the construction of the C. N. R. line from Hawkesbury to Montreal, has been let to J. P. Mullarkey, Montreal.

Public Buildings, Churches Schools, etc.

Arnprior, Ont.

We are informed that the only tender received for improvements in connection with high school was that of W. H. Mills at $12,970.

Berlin, Ont.

The Lyric Theatre here was damaged to the extent of about $3,000 on the 15th inst.

Belleville, Ont.

Tenders for the various works in additions to the General Hospital will be received by Mrs. L. H. Lewis, president W. C. A., until July 2nd. Plans at office of W. C. Mikel, K.C., this city.

Dartmouth, N.S.

The ratepayers will vote on the amount (about $4,500) for the new school on July 2nd.

Dauphin, Man.

Tenders for the purchase of $12,000 school debentures, 20-year at 5 per cent., will be received until July 15th. W. Smith Jackson, secretary-treasurer.

Elkhorn, Man.

A 6-room school costing $20,000 will be erected here.

Fredericton, N.B.

Tenders addressed to the secretary, Militia Council, will be received until about June 27th for construction of concrete wall at the rifle range. Eugene Fiset, Colonel, Deputy Minister.

Gravenhurst, Ont.

Tenders addressed to J. M. Lyle, architect, Toronto, are being received until June 27th for erection of new Presbyterian church. Plans, etc., with Rev. D. A. Mckeracher, Gravenhurst, or with the architect.

Hillsboro, N.B.

The Baptist church and parsonage were destroyed by fire on the 13th inst. Loss about $20,000.

Hamilton, Ont.

It has been decided to build a $20,000 addition to St. Joseph's Hospital. The Dominion Power & Transmission Company are negotiating for a site for the new Temple Theatre.

London, Ont.

King Street Presbyterian congregation have decided to build a new church. Mr. William Reid, chairman of the Building and Site Committee.

Lloydminster, Sask.

Mollard and Hunter have plans for a $15,000 building for post office and customs.

Meadow Lea, Man.

It is likely a new school will be built here. D. N. McIntyre, chairman of the Board.

Montreal, Que.

Mr. Jos. Venne, architect, is preparing plans for an extensive amphitheatre to be erected on Mount Royal in the interests of the Eucharist Congress, to be held in this city September next.

It is proposed that the city should acquire land on Park avenue between St. Viateur and Van Horne streets to be transformed into a public park.

It is expected that tenders will be called in the course of two weeks for the erection of a new and extensive school building for the Catholic Board of School Commissioners, "Dollard School." Messrs. Marchand & Haskell, architects.

Montreal West, Que.

The ratepayers have approved of a bylaw for the purpose of erecting a $30,000 municipal building. This will be built to accommodate the local civic offices, library and reading room and large entertainment hall.

Nanaimo, B.C.

The two Masonic Lodges of this city have decided to erect a new home at a cost of $30,000. A block of ground has been secured on the east side of Commercial street, 80 by 100 feet, on which a large brick and concrete block will be constructed. Work will be commenced on the structure as early as possible.

The members of Black Diamond Lodge, No. 5, I. O. O. F., of this city have decided to erect a brick and concrete structure on Commercial street, at an estimated cost of $20,000. Tenders for the construction of the building are to be called for at once.

Newmarket, Ont.

Tenders will be received until July 1st for the extension of Newmarket High School. E. Finch is the architect. For further particulars see "Tenders and For Sales Department" of this issue.

Ottawa, Ont.

Tenders are being called by this city for the painting of Cartier Street and Evelyn Avenue Schools. Specifications at office of W. B. Garvock, superintendent of buildings, Creighton Street School. C. Ross, secretary-treasurer.

Pense, Sask.

Tenders will be received until June 23rd for the erection of a town hall. J. F. Weiss, secretary-treasurer.

Smith's Falls, Ont.

Tenders are being called until June 27th for the trades required in connection with the erection of a public hospital here. For further information see advertisement in "Tenders and For Sale Department" this issue.

Toronto, Ont.

Tenders are being called until July 12th for the various trades required in the erection of fire station on Main street. For further particulars see advertisement in "Tenders and For Sale Department."

Tenders addressed to H. F. McNaughten, secretary, Public Works, were called until June 21st for supply of scrap iron, copper, lumber, etc.

The church of Friends on Carlton street has been purchased for about $40,000. Six months are given in which to secure a new site.

Tenders will be received until June 28th for the erection of a new band stand in the Exhibition Grounds. G. R. Geary (mayor), chairman, Board of Control.

The congregation of Grosvenor Street Presbyterian Church have decided to remove, and a committee consisting of T. Gibson, Dr. Gibb Wishart, R. Kilgour, Dr. Cameron and others, were appointed to report on new site.

Vancouver, B.C.

A permit has been issued to W. C. Stevens for a 5-storey steel concrete building on Westminster avenue. The contract will be let shortly.

Victoria, B.C.

The ratepayers will consider the expenditure of $13,000 on schools shortly.

Tenders for the erection of a new large one-room frame school at Nanaimo Bay are invited until June 29th by the Public Works Department.

Wadena, Sask.

The school board are getting a loan of $10,000 for a new school. L. C. Wurtz, secretary.

Woodstock, Ont.

Tenders addressed to [illegible], architect, will be received until June 30th for the addition, etc., to school building, section 1, West Oxford. Plans, etc., at office of the above.

Waskada, Man.

Tenders are called for erection of municipal and telephone office until July. Plans, etc., at office of the secretary, F. J. Davis.

Winnipeg, Man.

Leonard Kenwrick, 15 Bannerman avenue, is the architect for the new St. John's Anglican Cathedral. The nave will be erected first at a cost of $75,000. Noted in issue of May 18th.

The Dufferin avenue Presbyterians are contemplating the erection of a new church. Rev. Mr. McTaggart, pastor.

Plans have been approved for the Municipal Hall to be erected on the site given by F. Ness.

The board of directors of the Children's Hospital have purchased the old Ladies' College site on which, it is stated, they will erect shortly a new hospital. Cost of site and proposed building, about $80,000. Mrs. J. H. Bond and Fletcher Andrews are interested.

Longueuil, Que.

It is again rumored that the Dominion government will establish a military school and farm in the vicinity of Longueuil. Previously mentioned.

AWARDED.

Davidson, Sask.

K. J. Roseborough secured the contract for the new town hall. Solid brick, cost $14,000.

Edmonton, Alta.

A contract has been awarded for a new hospital building to the Connell-Spencer Construction Company at $170,000.

Larkin, B.C.

The contract for the new school at Larkin has been awarded to W. A. Blair, at $1,575.

Lytton, B.C.

The contract for the erection of the new lockup has been awarded by the Public Works Department to Mr. D. J. McRae, of Agassiz, at about $2,750.

Portage la Prairie, Man.

The contract as awarded in bulk for the school includes Jeffrey Bros., masonry, $13,350; McCaig & Elwood, carpentering; Jas. Grassie, tinsmithing and plumbing; C. W. Chapman, painting.

Rosthern, Sask.

Mr. Thos. R. Wood has taken the contract for a new Menonite church at Tiefengrund, at $3,000.

St. Catharines, Ont.

J. B. McIntyre, secretary, St. Catharines General and Marine Hospital, writes that the contract for the new hospital here has been awarded to Newman Bros., this city as per specifications of Langley & Howland for $46,000.

Toronto, Ont.

Tenders addressed to H. F. McNaughten, secretary, Public Works Department, will be received until June 28th for plumbing, etc., in Normal School, and also for heating, plumbing and electric wiring for the addition to Osgoode Hall. See advertisement in "Tenders and For Sale Department" this issue.

The contracts for the central wing of the Toronto Western Hospital have been awarded by the Board of Governors, and [illegible] Page & Company, [illegible] brick work; the Roman Stone Company supplying the stone; F. H. [illegible], the carpenter work; Hamilton Bridge Company, the steel work; Boyce & Son, the plastering; Douglass Bros., the galvanized iron work, and A. M. Brown, the painting and glazing. The steam heating and plumbing has not yet been let. Cost of [illegible] 000. Total proposed cost, [illegible].

The [illegible] tenders for the [illegible] School were: Mason work, Teagle & Sons, $16,366; steel work, Reid & Brown, $11,085; carpenter work, Frank Armstrong, $8,833; roofing, Flowers & St. Leger, $925; plastering, George White, $2,150; plumbing, Keith & Fitzsimons, $650; painting, J. Phinnemore, $1,245; heating and ventilating, Johnston Temperature Regulation Company, $885. For the new Earlscourt School —Mason work, Teagle & Sons, $13,200; carpenter work, Frank Armstrong, $8,456; structural steel, W. A. Falter, $964; roofing, Flowers & St. Leger, $1,075; plastering, Beaver & Company, $1,296; plumbing, Keith & Fitzsimons, $1,345; heating and ventilating, Keith & Fitzsimons, $5,500; heat regulation, Johnston Temperature Regulation Company, $450; wiring, G. J. Beattie. For the Norway School—Mason work, G. T. Gayton, $1,150; carpenter work, F. Armstrong, $9,989; structural steel, Reid & Brown, $1,523; roofing, G. M. Bryan, $1,125; plastering, Beaver & Company, $1,635; plumbing, Fred Armstrong, $1,184; painting, G. F. Egles, $1,340; heating and ventilation, Johnston Temperature Regulation Company, $749; electric wiring, G. J. Beattie, $38.

Winnipeg, Man.

The contract for the erection of technical school on the Church Mackray site, has been awarded to John Saul at $299,750; that for the school on the Academy road, to J. H. Tremblay & Company, Limited, at $299,849, the lowest tenderers in both cases. These contracts are exclusive of heating, plumbing and ventilating.

Residences

Edmonton, Alta.

J. C. Calhoun has commenced the erection of an $8,000 residence.

Hamilton, Ont.

A permit was issued to Thos. Lewis & Son, erection of a concrete stone dwelling, Holton avenue, $2,350.

Montreal, Que.

Tenders have been received for the construction of a residence on Dorchester street for Mrs. A. C. Ph...ps. No awards have yet been announced. Mr. Theo. Daoust, architect.

Tenders were received until June 16th for the construction of a residence on Aberdeen avenue for Wm. Waugh. Messrs. Hutchison, Wood & Miller, architects.

New tenders for the erection of a residence on Roslyn avenue for E. J. Coine, were received until June 21st. Messrs. Hutchison, Wood & Miller, architects.

Messrs. Peden & McLaren, architects, 20 St. Alexis street, have prepared plans and specifications for the erection of a residence for Mr. G. R. Woodburn. Tenders are invited up to the 27th inst.

Outremont, Que.

A permit has been awarded Mr. Fellows for the erection of three cottages on Wiseman avenue; cost $15,000.

Ottawa, Ont.

Mayor Hopewell has taken out a building permit for a $10,000 brick apartment house.

Strathcona, Alta.

Wilson & Herald are the architects in charge of the residences to be erected for Dr. Tory and Prof. Edwards.

Toronto, Ont.

W. J. Dempster, architect, this city is preparing plans for ninety-six working man's homes to be built by the Home Building Company of Toronto. They will [illegible] will be called for at once.

Victoria, B.C.

Messrs. Fettit Bros. have a permit for a 2-storey brick dwelling, corner Fernwood road and Gladstone, $6,000; also Mrs. A. Parter for a dwelling, $1,500.

Building permits were issued yesterday to H. T. Knott for a dwelling to be erected on [illegible] street, $2,700; and to W. C. Vanmunster for a dwelling on Medina street, $[illegible].

Tenders for the erection of a house for the caretaker at Smith's Hill reservoir were received from the following: T. Frederickson, $2,500; Robt. R. Scott, $4,141; J. Holland, $[illegible]; W. C. VanMunster, $3,[illegible]; Harris & Northam, $2,660; S. E. Matthews, $3,400; T. Tubman, $3,200; J. Smithers, $3,200; Nelson & Company, $2,[illegible].

Winnipeg, Man.

Architect H. Rugh is preparing plans for a solid brick residence for P. Cancilla, costing $7,000, and a residence for Mrs. J. P. McCrum to cost $5,000.

Wm. Bruce, architect, will build a $15,000 residence on Central avenue, Armstrong's Point. Architectural terra cotta and solid brick construction.

Alex. Macdonald, wholesale grocer, will have a $50,000 residence built on Park road this year.

Boyle, Higgins & Company intend to erect twenty mor ehouses and cottages.

Tenders addressed to C. W. U. Chivers, architect, 502 Keewayden Block, will be received until June 27th for all trades, excepting plumbing and heating, required in the erection of residence for [illegible] J. Christie. Plans, etc., at office of above.

A permit has been issued to J. Ryan, Jr., for a two and a half storey brick building, $25,000.

AWARDED.

Dauphin, Man.

Hafenbrak & Steen have been awarded the contract for R. Lily's $6,500 residence. J. H. Bossons, architect.

Montreal, Que.

Mr. W. E. Doran, architect, has awarded the general contract for the erection of a two storey house on Belmont street for Mr. B. Tansey, to D. M. Long, contractor, 39 Windsor street.

Winnipeg, Man.

Sparrow Bros. secured the contract for an $8,500 residence for J. A. Pottruff. Jas. Chisholm & Son, architects.

Business Buildings and Industrial Plants

Atikokan, Ont.

J. D. McArthur's mill on the C. N. R. was destroyed by fire on the 19th inst. Estimated value of plant, $50,000. The mill will be rebuilt at once.

Brandon, Man.

The Dominion Bank will enlarge its premises by building an addition.

Permits for the Cecil Hotel being erected by H. Johnson, $40,000, and to Dr. Eagles for new theatre, Tenth street and Princess avenue, $12,000, have been issued.

Beaverton, Ont.

Until June 28th tenders for the purchase of $5,000, 5 per cent. town hall debentures are being called. John McArthur, clerk.

Calgary, Alta.

St. Paul, Minn., capitalists will build a railway from Butte, Mont., to Calgary to develop mineral resources and will also establish a steel plant at Cowley, Alta.

Chas. Bell and J. Schiesel will build the King George Hotel, six storeys, solid brick and stone, fireproof.

Chilliwack, B.C.

Plans are prepared for the erection of a large building for W. J. Gillanders. J. Laughlin has the contract for the block being erected for F. Gillanders.

Cobourg, Ont.

Mr. Bull's Sawmill, at Skibbereen, about 12 miles from here, was destroyed by fire on the 16th inst.

Didsbury, Alta.

The Maple Leaf mill and elevator, which were recently destroyed by fire, will be rebuilt.

Fernie, B.C.

The Western Canada Wholesale Company are building a large addition to their warehouse.

Hamilton, Ont.

The county council have decided on the site for the poor house. Solicitor, J. L. Counsell.

Moose Jaw, Sask.

The Y. W. C. A. are negotiating for a building site.

Architect Bunyard has plans for a three storey brick and stone building, 65 x 100 feet, for J. E. Chisholm and A. Svaigher.

Montreal, Que.

Plans for the Dominion Express Building are nearing completion and tenders will be called in the course of two weeks. Messrs. E. & W. S. Maxwell, architects.

The plans for the new car barns for the Montreal Street Railway Company are now well under way and the architects, Messrs. Marchand & Haskell expect to call tenders for the construction of same shortly.

North Bay, Ont.

It is stated that the C. P. R. has promised to contribute $5,000 and free site toward the erection of a Y. M. C. A. building here.

North Vancouver, B.C.

The bonus asked for by the Imperial Car & Shipbuilding Company has been granted and they will probably lay down a plant at North Vancouver.

Ottawa, Ont.

The Laurentian Mica Company's premises on Bridge street were gutted by fire on the 16th inst. Loss, $9,000.

The directors of Slinn-Shouldis, Limited, have decided to erect a large bread factory. President W. H. Dwyer; secretary and general manager, E. Cushing. Capitalization, $200,000.

Port Colborne, Ont.

It is reported that the big cement plant here will be doubled shortly.

Quebec, Que.

La Compagnie Jacques Cartier have purchased a large tract of land in Limoilou Ward with the object, it is stated, of transforming it into a large pleasure park, similar to those in Montreal and Toronto.

Regina, Sask.

It is reported that the Bank of Commerce will put up a new building. It is rumored also that the building is to be for the National Finance Company, of Vancouver.

Sharon & Tripp, architects, have plans completed for a new block for Smith and Foley. Solid brick, three storeys. Cost, $13,000.

Summerland, B.C.

A fruit cannery will be erected at Summerland.

Saskatoon, Sask.

A four storey addition is to be made to the Michaels' Block for the Regina Trading Company.

F. C. Ball & Company, of Winnipeg, will build a large three storey brick warehouse to cost $20,000.

Geo. Gray, of Hull, Que., a pork packer, is negotiating for site for a western branch factory proposed to be opened during the present year. Other plants at Hull, Peterboro and Montreal.

St. Stephen, N.B.

Tenders were called until June 22nd by J. W. Fraser, manager, Bank of Nova Scotia, for erection of branch building.

St. John, N.B.

Tenders addressed to G. Ernest Fairweather, architect, will be received until June 28th for masonry, carpentry, metal work and painting required for the extension of the St. John Exchange of the New Brunswick Telephone Company.

St. Catharines, Ont.

Tenders are being called for the work in connection with the alterations and improvements to the Merritton mill for McSloy Bros., of this city. Plans, etc., at office of the architect, T. H. Wiley, St. Catharines.

St. Lambert, Que.

The Parker Foundry Company, it is stated, have acquired a tract of land and will erect a large factory in the district. Two other concerns have also applied to the town for exemption from taxes for a number of years, which, if granted, will mean the erection of several factories. The Grand Trunk Railway Company are also planning to lay large terminal yards along the south side of their tracks to relieve the congestion of the city yards.

Toronto, Ont.

The planing mill of Scholey Bros. was gutted by fire on the 14th inst. Loss, about $3,000.

Eustace G. Bird is the supervising architect for Messrs. Carriere & Hastings of New York, on the head office of the Bank of Toronto, corner Bay and King street. Noted previously.

It is reported that the International Harvester Company has purchased land on Dundas street for a building site for their sales office.

Messrs. Bond & Smith are the architects in charge of the erection of the building to be erected on Richmond street for the Toronto Engraving Company. Noted in last issue.

The Consolidated Plate Glass Company, of Canada, Limited, 73 Wellington street, have purchased a new site on Spadina avenue, between Grange and Sullivan streets, on which a new 5-storey factory will be erected.

It is announced that W. A. Murray Company has amalgamated with John Kay Company, and that it is likely extensions to the present premises will be made shortly. Capitaiization of new concern, $3,000,000. Watson T. Bradshaw, managing director.

Victoria, B.C.

L. B. Royce, of Fort Atkinson, Wis., is investigating as to the desirability of locating a Canadian branch of the carriage, waggon and chair factory, of which he is the representative.

It is stated that Charles Hayward will erect a three storey block on corner of Douglas street and Pandora avenue.

The Middlesbrough Steel Strip and Hoop Company is interested in a project for establishing iron and steel mills, including blast furnaces and rolling mills, on Vancouver Island.

Vancouver, B.C.

The Wood-Vallance Company will extend their warehouse.

Messrs. Fremlin & Company have a permit for a $25,000 4-storey warehouse. Contractor, F. Raymer; Messrs. Endacott & Perceval are interested.

Kelly, Douglas & Company, wholesale grocers, of Vancouver, New Westminster and Prince Rupert, will immediately commence the construction of a large warehouse at the Grand Trunk Pacific terminal. The structure will be five storeys in height and 50 by 168 feet in ground area.

French capitalists recently acquired 312 feet of east end waterfront property adjacent to the Vancouver Sugar Refinery, paying $256,000. The waterfront is crown granted and extends into the inlet a distance of 1,500 feet. The selling price represents a little over $800 per front foot.

Welland, Ont.

Plans are being prepared for the office building of the Page-Hersee Tube Works.

Winnipeg, Man.

Architect Bellhouse has completed plans for a $25,000 addition to the Ashford block on Balmoral street.

Tenders addressed to Frank R. Evans, Somerset Building, will be received until June 25th for all trades (except heating) for the erection of block for Messrs. R. & J. Johnston. Plans at office of F. R. Evans, architect.

The C. N. R. will erect an hotel here, possibly on the site of the old Manitoba hotel.

Plans for the Gordon Mitchell Drug Company have been prepared and call for a three-storey, brick and millwork building to cost about $25,000. Jordan & Over, architects.

J. J. Vopin is the contractor for the 3-storey stone building for the Logberg Printing Company, corner Wililam and Nena streets.

The McClary Company will build an addition to their warehouse on Bannatyne avenue.

Chas. H. Hays, president of the G .T. P., is credited with the statement that a large hotel will be built here shortly.

Green & Company, millinery importers, will start on the erection of their block, corner Ellice avenue and Hargrave street shortly. Approximate cost, $40,000.

AWARDED.

Coquitlam, B.C.

A contract for the erection of the pump house and engineer's residence at the Coquitlam Retreat has been let by the Minister of Public Works to the Westholme Lumber Company, at $4,800.

Edmonton, Alta.

The contract for the construction of the Hudson Bay Company's barns has been given to the Charles May Construction Company.

Fort William, Ont .

Russell Bros. have the contract for the erection of a warehouse to be erected for Symes & Company, Hardisty and Leith streets, at $17,000. R. E. Mason is the architect.

Melfort, Sask.

Sidney Smart secured the contract for the Bank of Hamilton's new brick building on a bid of $11,750.

Montreal, Que.

The contract for the erection of a steel superstructure of the new Windsor Street station of the C. P. R. Company has been awarded to the Dominion Bridge Company.

The contract for the erection of a new office and factory building for the Dominion Tobacco Company has been awarded to Mr. Joseph Dagenais, lowest tenderer at $24,300. Mr. C. Dufort, architect.

General contract for the erection of new building for the Mount Royal Riding Academy has been awarded to Mr. F. M. Hartman. Steel work will be erected by the Structural Steel Company, of Longue Point. The work has been placed under way. Mr. R. Montgomery Rodden, architect.

General contract for alterations to property at 633-638 St. Catherine street east for Mr. Chas. Gauvreau, has been awarded to A. Lavallee, contractor, 27 Breboeuf street.

General contract for alterations to property at 91 Notre Dame street west, for Mrs. Riddell, London, England, has been awarded to O. Lebleau, contractor, Board of Trade Building. Architect, Jos. Wechselberger, 171 St. James street.

Prince Albert, Sask.

The Canadian Crocker-Wheeler Company, Limited, St. Catharines, Ont., are stated to have secured the contract for the equipment of the Big River Lumber Company's plant here.

Toronto, Ont.

The contract for the cornice and galvanized iron work at the building for Heintzman & Company, has been awarded to A. B. Ormsby, Limited.

Power Plants, Electricity and Telephones

Calgary, Alta.

Tenders will be received until July 12th for one 750 B.H.P. engine, 300 r.p.m., with condensor; also one 600 k.w.d.c. 600 volt generator switchboard, etc. H. E. Gillis, city clerk.

Port Arthur, Ont.

The bylaw for $30,000 for extension and equipment of municipal telephone service and also for $10,000 for extension of the electric lighting system were carried.

Saskatoon, Sask.

The Saskatchewan Power Company will build a generating plant 12 miles below the city at an estimated cost of $1,000,000. Noted in issue of May 25th.

Shepherd & Taylor, of Edmonton, are considering the building of a street railway system in Saskatoon.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman Board of Control, will be received until June 27th for supply of wire; also until June 23rd for pole line supplies. Specifications obtained from the Toronto Hydro-Electric System, City Hall.

Winnipeg, Man.

The Board of Control has recommended that space be given for erection of. a 350 steel tower and an office building for a wireless telegraph station on the Exhibition grounds. W. Beaton is the local manager.

Tenders addressed to the chairman of the Board of Control will be received until July 4th for supply and erection of two sets of line disconnecting switches, with mechanism. Plans, etc., at Power Engineer's office, this city. M. Peterson, secretary. See advertisement in this issue.

AWARDED.

Guelph, Ont.

The City of Guelph have awarded to the British Aluminium Company, Limited, (Canadian agents, Parke & Leith) the contract for about 5 miles of No. 3/0 B. & S. gauge and 300,000 C. M., double braided weatherproof insulated aluminum cable to be installed between the sub-station of the Hydro-Electric Power Commission and the local sub-station here.

London, Ont.

Contract for a steel tower to be used in connection with electrical distribution was awarded to the Ontario Wind Engine and Pump Company, Toronto, for $585 f.o.b. London, and $175 for erection.

Minnedosa, Man.

Snyder Bros., of Winnipeg, secured the contract to build a dam on the Little Saskatchewan on a bid of $41,528.

Montreal, Que.

The Swedish General Electric Company, through their Montreal sales manager, Mr. H. D. Bayne, has been awarded the contract for electrical equipment required for the Jacobs Building sub-station of the Dominion Light, Heat & Power Company. One 150 h.p. motor generator set and one 350 k.w. engine type generator will be installed. The latter to be directly connected to a Belliss & Morcom vertical engine supplied through Messrs. Laurie & Lamb.

The Canadian Westinghouse Company, Limited, has secured through the Montreal sales office, contract from the Quebec Railway, Light, Heat & Power Company for this season's transformer requirements. Also for 25,000 volt lightning arresters, disconnecting switches and choke coils.

G. W. T. Nicholson, general contractor, has received a contract from the Canadian Light & Power Company for the erection of superstructure of power house at Valleyfield.

James Ballantyne, general contractor for the plumbing and heating of the Saskatchewan University Buildings designed by Messrs. Brown & Vallance, has awarded sub-contracts as follows, in connection with the 600 h.p. lighting and heating plant which will be installed: Ross & Greig, representing Sheldon's, Limited, heaters and nine ventilating fans; Canadian Westinghouse Company, switchboard apparatus, one 30 k.w. generator, one 125 k.w. generator; Laurie & Lamb, one Belliss & Morcam 125 k.w. engine, Robb Engineering Company; three 250 n.p. boilers, one 225 h.p. boiler, one 30 k.w. high speed engine.

The Canadian Light & Power Company have awarded the contract for their complete transmission line requirements of high tension and other insulators to the Locke Insulator Manufacturing Company, of Victor, N.Y., through their Montreal representatives, the Engineering Equipment & Supply Company.

The contract for galvanized transmission towers, on the main line from Valleyfield to Montreal has been awarded to the Canadian Bridge Company of Walkerville. The special painted towers which will be employed at crossings, are to be constructed by the Dominion Bridge Company, of Lachine. Mr. Geo. T. Nicholson has been awarded the contracts for the erection of all superstructures for the power house.

Quebec, Que.

We have been informed that A. C. Argall Company, of Montreal, have been awarded the contract for the reinforced concrete dam at the power station of the Deschambault Electric Company, St. Alban, at $31,300. J. F. Guay, consulting engineer.

(Continued on page 29)

Tenders and For Sale Department

Newmarket

Tenders will be received up to the evening of [illegible] for [illegible] extension to Newmarket High School.

Building [illegible] two storeys and basement, stone and brick, slate and iron roof, modern [illegible].

Tenders will be received in a lump sum or separately for the various trades.

Plans and specifications may be seen on or after [illegible] at the office of the [illegible].

O. E. TENCH,
Queen Street, Newmarket.
26

Tenders for

Road Pavement

Sealed tenders will be received at the Town [illegible] up to noon on MONDAY, [illegible] 1910, for the construction of approximately 6,950 square yards of Bituminous Pavements.

Plans and specifications may be seen at the offices of the Town Clerk at any time during office hours.

Tenders to include concrete, base, curbs and surfacing, which may be made en bloc or separately.

The lowest or any tender not necessarily accepted.

F. KNOWLSON,
Town Clerk.
[illegible]

Hospital Board

Smith Falls

Tenders Wanted

Sealed tenders (separate or bulk) addressed to the Secretary of the Board will be received until MONDAY, 5 P.M., JUNE 27TH, 1910, for the necessary trades in connection with the erection of a (brick and stone) Public Hospital in the Town of Smith's Falls.

Plans and specifications may be seen at the office of G. F. Martin, architect, Smith's Falls. Each tender to be accompanied by a marked cheque equal to 5 per cent. of same, payable to the Secretary of the Board.

The lowest or any tender not necessarily accepted.

F. WHITCOMB,
Chairman of the Board.

W. PARK,
Secretary.

Tenders for

Bridge Construction

Tenders will be received at the office of the undersigned up to six o'clock p.m. on MONDAY, JUNE 27TH, 1910, for the construction of Concrete Abutments and a Reinforced Concrete Truss Bridge of 73-foot span, over the Humber River between lots 15 and 16, con. 8, Township of Vaughan, known as Elder's Bridge.

Plans and specifications may be seen and all necessary information may be obtained at the office of the undersigned, 57 Adelaide Street E., Toronto.

The lowest or any tender not necessarily accepted.

BARBER & YOUNG,
Engineers,

Toronto, June 15th, 1910. 25

Town of North Bay

Tenders for

Concrete Sidewalk

Sealed tenders will be received by the Town Clerk of the Town of North Bay, Ont., up to SATURDAY, 2ND JULY, 1910, for the furnishing of all materials and the construction of approximately 60,000 square feet of Concrete Sidewalk. Specification may be seen in the office of the Town Engineer, Town Hall, North Bay. A marked cheque for $100 to accompany each tender. The lowest or any tender not necessarily accepted.

JAS. SINTON,
Town Engineer.

M. W. FLANNERY,
Town Clerk.

25

Town of Dunnville

Province of Ontario

Notice to Contractors

Sealed tenders, addressed to the Town Clerk, will be received until 8 p.m. on TUESDAY, 28TH JUNE, 1910, for the completion of a system of which have been partly constructed by contractors and by the corporation. Plans, profiles, specifications, etc., may be seen at the Town Clerk's office, Dunnville, or at the office of the engineer, Toronto.

ROBT. BENNETT, Esq.,
Mayor, Dunnville, Ont.

J. W. HOLMES, Esq.
Town Clerk,
Dunnville, Ont.

WILLIS CHIPMAN, Esq.,
Chief Engineer,
Toronto, Ont.

25

To Contractors

Sealed tenders, endorsed "Tender for Heating, Plumbing and Electric Wiring for the Addition to Osgoode Hall," and "Tender for Plumbing in Lavatories of the Normal School, Toronto," addressed to the undersigned, will be received at this Department until noon, TUESDAY, JUNE 28TH. Plans and specifications may be seen at this Department.

An accepted bank cheque, payable to the order of the Hon. J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender, and the bona-fide signatures and addresses of two sureties, or the bond of a guarantee company, must accompany each tender.

By order,

H. F. McNAUGHTEN
Secretary, Public Works Department.
Department of Public Works, Ontario.

Toronto, June 17th, 1910.

Newspapers publishing this advertisement without authority will not be paid for it. 25

Town of Outremont

Tenders for Sidewalks

Tenders will be received by the undersigned up to FRIDAY, THE 24TH OF JUNE at 8 p.m. for the construction of about 10,000 running feet of concrete sidewalks. Specifications at the town hall. A deposit of 10 per cent. will be required.

The lowest or any tender not necessarily accepted.

J. KRUSE,
Secretary-treasurer.

25

City of Winnipeg

Hydro-Electric Power Developement

Tenders for Line Disconnecting Switches

Sealed tenders on prescribed forms, addressed to the Chairman of the Board of Control, Winnipeg, Canada, and marked on the envelope "City of Winnipeg Hydro-Electric Power Development—Tender for Line Disconnecting Switches," will be received at the office of the undersigned up to 11 a.m. on MONDAY, 4TH JULY, 1910, for supply and erection of two sets of Line Disconnecting Switches with mechanism.

Copies of plans, specifications and form of tender may be obtained at the Power Engineer's Office, Carnegie Library Building, Winnipeg.

Each tender must be accompanied by a certified cheque for one hundred and fifty dollars, which cheque will become forfeit to the corporation in the event of the successful tenderer refusing or neglecting to sign a satisfactory contract when called upon so to do.

The City reserves the right to reject any or all tenders or to accept any bid which shall appear advantageous.

M. PETERSON,
Secretary.

Office of the Board of Control, Winnipeg, June 16th, 1910. 25

City of Moose Jaw

Saskatchewan

Main Drainage Works

Sealed tenders endorsed "Tender A," "Tender B," etc., will be received by the undersigned City Clerk until 8 o'clock, p.m., on MONDAY, JULY 18TH, 1910, for the following:

Contract "A." Supplying material for and constructing Sewage Disposal Plant complete, and laying Trunk Sewer.

Contract "B." (1) Supplying and installing a complete Air Lift System; (2) Supplying and installing one electrically-driven Centrifugal Pump and Auto Starter.

Contract "C." Supplying and delivering 3,000 cords of Field Stone.

Plans and specifications may be seen at the office of the City Engineer, Moose Jaw, and also at the office of the "Canadian Engineer" at the following addresses:

Toronto, 62 Church Street.
Montreal, B33 Board of Trade Building.
Winnipeg, Room 404 Builders' Exchange Buildings.

The lowest or any tender not necessarily accepted.

J. M. WILSON,
City Engineer.

W. F. HEAL,
City Clerk.

Moose Jaw, Sask., July 16th, 1910. 28

Notice to Contractors

Whole or separate tenders for the various trades required in the erection of a Municipal Building in the Town of Sudbury will be received by the undersigned up to 6 p.m., MONDAY, JUNE 27, 1910. Tenders to be accompanied by a marked cheque for 5 per cent. of the amount of the tender, made payable to L. O'Connor, Mayor, cheques to be returned to unsuccessful tenderers.

Lowest or any tender not necessarily accepted.

Plans, etc., may be seen at the office of the architect, Jas. Thomson, 43 Victoria street, Toronto, or with George Elliott, Town Clerk, Sudbury.

Apply

L. O'CONNOR,
Mayor.

25

City of St. John

Tenders for Paving

For paving in Germain Street, between Princess and Queen Streets, according to plans and specifications to be seen and forms of tender obtained at the office of the City Engineer, Room No. 5, City Hall, duplicates of which are on file in the office of the "Contract Record," 504 Confederation Life Building, Toronto.

A cash deposit must accompany each bid, the amount being stated in the specification,

The city does not bind itself to accept the lowest or any tender.

All tenders must be addressed to the Common Clerk, Room No. 3, City Hall, who will receive bids until noon of TUESDAY, THE 28TH DAY OF JUNE, A.D. 1910.

ADAM P. MACINTYRE, Comptroller.
WM. MURDOCH, City Engineer.

St. John, N.B., June 17th, 1910. 25

Tenders

For New Fire Hall on Main Street—East Toronto

Bulk tenders, or tenders for the several trades mentioned below, in connection with the above building will be received by registered post only, addressed to the undersigned, up to noon on TUESDAY, 12TH JULY, 1910.

1.—**Mason work, etc.**
2.—**Carpenter work.**
3.—**Galvanized iron and plumbing.**
4.—**Gas fitting and plumbing.**
5.—**Hot water heating.**
6.—**Electric wiring.**
7.—**Plastering.**
8.—**Painting and glazing.**

Plans and specifications may be seen and forms of tender and all information obtained at the office of the City Architect, Toronto.

Envelopes containing tenders must be plainly marked on the outside as to contents. The usual conditions relating to tendering, as prescribed by city by-laws, must be strictly complied with, or tenders may not be entertained.

Tenderers shall submit with their tender the names of two personal sureties or the bond of a Guarantee Company.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman, Board of Control.

City Hall, Toronto, June 16th, 1910. 25

Tenders

will be received until MONDAY, 27TH INST., for the necessary

Brick, Masonry, Cut Stone, Fire-Proofing, Etc., Works

for a mansion to be erected on Davenport road, near Walmer road.

Plans and specifications can be seen and any other information obtained at the offices of the architect, 164 Bay Street.

E. J. LENNOX,
Architect.

25

Notice to Architects

The time for receiving competitive designs for the residence of the Lieutenant-Governor of the Province of Ontario, in the City of Toronto, has been extended to AUGUST 10TH, NEXT.

J. O. REAUME,
Minister of Public Works.

Department of Public Works, Ontario, Toronto, June 21st, 1910.

For Sale

Steam Shovel

One Style "A" Marion Steam Shovel, 1½ yard dipper capacity, about 45 tons working weight, in first-class condition, with new extra heavy reinforced boom, latest style new independent crowding engines, all thoroughly overhauled, the boiler just re-tubed. Can be inspected where it is now working. Offered subject to inspection and acceptance before shipment, and subject to prior disposition.

Apply

F. H. HOPKINS & CO.,
New Imperial Bank Bldg., Montreal.

24

Positions Vacant

Advertisements under this heading two cents a word per insertion.

WANTED—TRAVELLING SALESMAN to represent firm manufacturing bank, office and store fittings. Must be competent to make sketches, etc. Man having experience in architect's office preferred. Apply, Box 974 "Contract Record," Toronto. TF

Miscellaneous

Advertisements under this heading two cents a word per insertion.

PINE PILING—Can supply large quantities pine piling, any length up to, say, 70 feet, on cars C. N. O. R. Apply to A. Prentice, 649 Bathurst Street, Toronto, 'Phone College 5729, or A. McPHERSON & COMPANY, Longford Mills, Ont. T.F.

FOR SALE—One 50 h.p. return tubular boiler; one 45 h.p. high and low pressure engine. Formerly run planing mill. Also several other boilers and [illegible] EVANS COMPANY, Limited, Sudbury, Ont. 26

FOR SALE—84 pieces Lackawanna Steel Sheet Piling, 22 feet long, 12 inches wide, three [illegible] Forge Company [illegible] in good condition, immediate delivery here, boat or rail. WM. LESSLIE, Walkerville, Ont. TF

Power Plants, Electricity and Telephones

(Continued from page 27.)

Toronto, Ont.

The British Aluminium Company, Limited, through their Canadian agents, Messrs. Parke & Leith, have been awarded by the Hydro-Electric Power Commission of Ontario, a contract for about 500 miles of bare aluminium cable, ranging in size from No. 2 to No. 4/0 B. & S. gauge to be installed between the several stations.

Winnipeg, Man.

The contract for power and electric lighting wiring of the new workshop which the Dominion Bridge Company of Lachine are erecting here, has been awarded to W. J. O'Leary & Company. Approximately 1,000 h.p. in motors will be installed and the wiring will be in conduit.

Miscellaneous

Brandon, Man.

Building permits have been issued to:—Flavelle & Hills, 4 residences, $10,800; C. Twiss, residence, $4,800; Grace Mendham, residence, $2,000; Hamilton Provident Loan Society, addition on 11th street, $3,000; J. Forbes, brick veneer residence, $2,800.

Hamilton, Ont.

Engineer Sing, of the Dominion government, has received instructions to prepare plans and specifications for the extension to the revetment wall and call for tenders for the work. Government estimates provided $20,000.

Montreal, Que.

Recent building permits include: Mrs. D. Hart, 296 Sherbrooke West, alterations to dwelling, $2,500; L. A. Herdt, 83 Durocher street, alterations to dwelling, $4,200; G. Gaudreau, 640 St. Catherine street east, alterations to store and dwelling, $8,500; M. Riddell, London, England, alterations to one house, $5,000; Montreal Racquet Club, Concord street, alterations to club house, $2,500; Catholic School Commissioners of Montreal, 85 St. Catherine street w., school building, $1,600; also one school building, $65,000; F. E. Riopelle, 1102 Rachel, two houses containing six dwellings, $10,000; F. Guerin, 211 Esplanade, one house, $3,000; Wm. Bedard, 421 Alwyin, one house containing three dwellings, $3,000; George Rattleade, 276 Marquette, one house containing three dwellings, $3,000; Jos. Gareau, 134 Coursol, one house containing three dwellings, $4,300; J. P. Lacroix, 786 Marie Anne, one house containing six dwellings, $3,800; R. Marsolais, 770 Dorion street, two houses containing six dwellings, $6,000; E. Leveille, 9 Villeneuve, one house containing three dwellings, $4,500; A. Vallee, Ste. Anne de Bellevue, one house containing three dwellings, $5,000; P. Dubois, one house containing three dwellings, $4,000; H. Vallee, 75 St. Elizabeth street, one house containing three dwellings, $3,000; H. Kellert & Sons, St. James street, office and warehouse, $166,000; B. Tansey, 10 Belmont, one house, $5,500; Ideal Savings, Loan and Land Company, [illegible] w., two houses containing four dwellings, $4,000; Montreal Light, Heat & Power Company, coal storage, $54,000; A. Ladouceur, 29 Bonapartel, one house containing four dwellings, $6,000; E. Therrien, 1764 Esplanade, six houses containing [illegible] dwellings, $17,000; W. Piche, 1760 Mance, two houses containing six dwellings, $9,000; T. Chartrand, one house containing three dwellings, $7,000; Blumenthal Estate, one office building, $150,000; P. Dore, [illegible] Colonial avenue, one house containing dwellings, $3,000; T. G. Dugas, 2850 St. Lawrence, one house containing two dwellings, $3,000; G. Duchesneau, 38 Laurier west, two houses containing ten dwellings, $6,000; Trudeau & Cecise, 893 St. Lawrence avenue, two houses containing six dwellings, $8,000; A. Marceau, 315 Visitation, two houses containing six dwellings, $7,500; Protestant Board of School Commissioners, one school building, $50,000; Yorkshire Insurance Company, 55 St. Francois Xavier street, one office building, $100,000; A. Fortier, 1663 Hutchison street, one house containing three dwellings, $9,000; J. L. Savignac. St. Cesaire, Que., one house containing three dwellings and one store, $8,000; C. C. Ballantyne, of the Sherwin-Williams Company, one house, $200,000; H. Forget, 1956 Dufferin street, six houses containing ,eighteen dwellings, $18,000; Matthewson Sons, one warehouse, $7,000; Mde. R. Roy, 65 Notre Dame street, Maisonneuve, two houses containing ten dwellings, $5,000; C. Therrien, 37 St. Joseph, one house containing two dwellings, $3,500; Clavel & Fils, 1317 Papineau, three houses containing six dwellings, $3,000; J. Corbeil, 2510 St. Hubert, two stores, $6,000; M. Drault, 287 Sanguinet, four houses containing twelve dwellings, $12,000; Sovereign Lime Works, 1279 St. Denis, two houses, $15,000.

Ottawa, Ont.

Recent building permits include; Donald Fraser, two brick veneer dwellings and shops, LeBreton street, $5,500; E. M. Mavaut, brick veneer dwelling, Centre street, $3,000; C. P. Wright, concrete shop, Rideau street, $3,000; W. J. Campbell, brick veneer apartment houses, Laurier avenue west, $16,000; A. Tracey, two detached brick veneer dwellings, Spruce street, $5,000; F. W. Bum, brick veneer dwelling, MacLaren street, $6,000; D. Skuce, double dwelling veneer, Gloucester street, $2,500; T. D. McFarlane, brick factory, Laurier avenue west, $4,500; W. J. Tyndall, double brick veneer dwelling, Laurel street, $3,000; H. Hitchman, double brick veneer dwelling, Arlington avenue, $4,000; Sam. McCormack, brick veneer shop and dwelling, Laurier avenue, $6,000; C. A. Benoit, double brick veneer dwelling, spruce street, $2,500; J. A. Low, brick veneer dwelling, Brighton avenue, $2,500.

Toronto, Ont.

Recent building permits include: G. F. Bailey, pair semi-detached 2½-storey brick dwelling, Macdonnell avenue, $5,000; Grimshaw Bros., 2½-storey brick dwelling, on Foxbar road, $5,000; G. Griffin, 2-storey brick apartments, St. Vincent street, $12,000; Dr. E. C. Burson, 2-storey and attic brick dwelling, St. Clair avenue, $17,000; F. J. Aylward, 2-storey and attic brick dwelling, Highlands avenue, $6,850; J. Macdonald, 2-storey frame and galvanized iron stable, Balmoral avenue, $4,000; R. B. Storey, 2 detached 2-storey and attic brick dwelling, Geoffrey, $6,000; R. O. Dickson pair semi-detached 2½-storey brick dwelling, Empress Crescent, $8,500; Wm. Robinson 5 pair semi-detached 2-storey brick dwelling, Sheridan, $20,000; Sinclair & Boddy, pair semi-deached 2-storey brick dwellings, Booth, $5,000; H. F. Squires, 3 attached 2-storey brick dwelling, Clinton, $6,000; G. C. Moore, 2-storey and attic brick dwelling, Whitney avenue, $8,000; A. Roberts, 3 attached 2-storey brick stores and dwellings, College street, $7,000; Morris Reid, 2 detached 2½-storey brick dwellings Geoffrey, $7,000; E. G. Switzer, 3 pair semi-detached 2-storey brick dwelling, Clendale, $18,000; Sykes & Knox, 3 pair semi-detached 2-storey brick dwelling, Dufferin, $12,000; Wilkins & Company, 6 pair semi-detached 2½ storey brick dwellings, Bathurst street, $30,000; S. F. Harvey & Company, 3-storey brick factory, corner Dundas and Ritchie, $18,000; Zinke & Johnston, 2½-storey brick dwelling, Mavety street, $5,200; T. H. Wood, 1-storey brick addition to dwelling, Bloor street east, $6,000; J. H. Lock, 2-storey brick apartments, Major, $6, 000; W. J. Ingram, 2½-tsorey brick dwelling, Logan, $5,000; Kling Bros., 3 attached 2-storey brick stores and dwellings, Queen street east, $8,000; Wm. Hodgkinson, 3 attached 2-storey brick front, roughcast dwelling, Tiverton avenue, $5,000; F. Courtemanche, 2 detached 2-storey brick dwellings, Kelle street, $6,000; F. Courtemanche, 2 detached 2-storey brick dwelling, Kelle street, $6,000;; R. Fasken, 3 attached 2-storey brick dwelling, Cobourg avenue, $6,000; Alex. M. Stewart, pair semi-detached 2-storey and attic brick dwelling, Lansdowne, $5,800; Davidson & Company, 3 attached 2-storey brick dwelling, Montrose, $6,000; H. Thomas, 3 attached brick dwellings, Perth avenue, $8,000; B. J. Case, 3 detached 2½-storey brick dwelling, Westminster, $12,000; Robt. Brown, 3 pairs semi-detached 2-storey brick dwellings, Symington, $8,000; Chappell & Joyce, pair semi-detached 2-storey brick dwellings, Campbell, $7,500; Dr. J. McCollum, 2-storey and attic brick addition to dwelling, corner Jarvis and Shuter, $6,000; A. T. Reid, 2-storey brick addition to dwelling, South Drive, $5,000.

Vancouver, B.C.

Building permits were granted as follows: A. A. Arnold, 2426 Sixth avenue w., $3,000; A. Knight, 2834 Spruce street, $4,000; S. W. Hopper, 2008 Marine Drive, $3,0000; Wm. Ellis, 2860 Marine drive, $3,000; Bentley & Wear, 2263 Seventh avenue west, $3,000; Mrs. M. Crawford, 1524 Fourteenth avenue east, $3,000; D. Naiffzinger, 345 Eleventh avenue west, $4,500; G. C. Coulson, 1065 Eleventh avenue west, $4,500; A. McLellan, 1145 Lily street, $2,700; C. P. R., frame shop on reserve, $3,600; A. Mains, 725 Thirteenth avenue, $2,500; a grand stand at the Exhibition grounds, architect, Donnellan & Donnellan, $30,000.

Victoria, B.C.

Tenders for garbage tins were received from the following: A. Blygh, $2.39½; W. Wilson, $4; L. Peake, $3.99; Geo. Powell, & Sons, $3.10; Watson McGregor, $2.75 and $3; C. M. Cookson, $2.95; P. R. Little, $2.49; T. A. Johnson, $2.55 and $2.60; H. Cooley & Son, $3; Hayward & Dodds, $2.25 and $2.65; A. & W. Wilson, $5.50.

Winnipeg, Man.

Recent building permits include: A. C. Galbraith, ten houses on Newman street between Portage avenue and the river $25,000; Patrie Manufacturing Company, warehouse, north side of Henry, apposite Tecumseh, $22,000; Gallagher, Holman & Lafrance, meat market, King street, between Rupert and Pacific, $20,000; Dunn & Wallace, house, west side of Home, between Buell and Bath, $5,000; P. C. Keller, house, north side of Athol, between Main and Mac, $3,500; J. M. Finlay, four houses, south side of Merrion, between Pembina and Nassau, $8,000; W. W. Fleming, west side of Home, between Buell and Bath, $4,000; G. O. Aulsebrook, north side of Fawcett, $4,000; A. McDonald, two houses, south side of Arnold, $6,500; B. C. Cockshutt, four dwellings, south side of Martin street, $7,200; R. Butcher, dwelling, north side of McDermot avenue, between Emily and Monckman streets, $4,000; L. Aysaiasky, school building, north side of Manitoba avenue, between McKenzie and McGregor, $4,000; S. A. McNab, dwelling, on west side of Ruby street, between Portage and Buell, $5,000; J. Matthews, six houses north side of Morely, between Pembina and Hay, $18,000; Smith & Kirkpatrick, two dwellings, west side of Arlington, between Buell and Bath, $8,000; F. W. Harvey, house, north side of Bannerman, between Mac and Scotia, $3,000.

AWARDED.

Ottawa, Ont.

The contract for the construction of section four of the Trent Valley canal has been awarded to Haney, Miller and Quinlan, at about $1,000,000.

Quebec, Que.

Contracts for fire hose were awarded as follows: 1,000 feet ''Red Cross,'' at $1, to the Mechanic Supply Company, and 1,000 feet of ''Arrow,'' at 95 cents to the Canadian Rubber Company.

Welland, Ont.

A contract for improvements in the Welland canal at Port Colborne has been awarded to M. J. Hogan, or Toronto. The figure is $74,000.

New Companies

Western Plastering Company, Winnipeg, Man., capital $20,000. Incorporators, Wm. McCartney, plasterer, and Geo. H. Elliott, accountant, both of Winnipeg, Man.

The Oliver Chilled Plow Works, of Canada, Limited, incorporated, capital, $1,000,000. Incorporators: J. Doty Oliver, J. Oliver, E. Nicar, R. A. Smart,, all manufacturers, of South Bend, Indiana, U.S.A., and W. A. McInerny, attorney-at-law, of the same city.

Canadian Steel Corporation, Hamilton, Ont., $25,000,000, incorporated. Incorporators, C. S. Wilcox, C. A. Birge, R. Hobson, all of Hamilton; L. Harris, Brantford, all manufacturers; and H. S. Holt, C. E., Montreal.

Ontario Bridge Company, Limited, Toronto, Ont., capital $40,000. Incorporators, F. W. Sage, contractor, and John H. Hutton, draughtsman, both of Toronto.

Cadwell Dredging Company, Limited, Windsor, Ont., capital $50,000. Incorporators, Walter Cadwell, contractor, and Oscar E. Fleming, K.C.

Canada Steel Company, Limited, Hamilton, Ont., capital $300,000, incorporated to manufacture, deal in, etc., all kinds of machinery, such as boilers, generators, plumbers' wares in iron. Incorporators, Jas. L. Ross and Arthur W. Holmested, barristers-at-law, Toronto, Ont.

The Camden Independent Telephone Company, Limited, Newburg, Ont., capital $7,500. Incorporators, Milton I. Beenan, physician, and Jas. H. Nugent, bank manager.

The Goderich Rural Telephone Company, Limited, Goderich, Ont., capital $5,000. Incorporators, Chas. C. Lee and Walter W. Saults, merchants, Goderich, Ont.

The Western Canada Construction Company, Winnipeg, Man., capital $30,000. Incorporators, Albert Thexton, and Clarence H. Thexton, contractors, St. Thomas, North Dakota.

E. B. Reese Engineering Company, Limited, Winnipeg, Man., capital $50,000. Incorporators, Edward B. Reese, electrical and mechanical engineer, and Wm. J. Ireland, civil engineer and architect, Winnipeg, Man.

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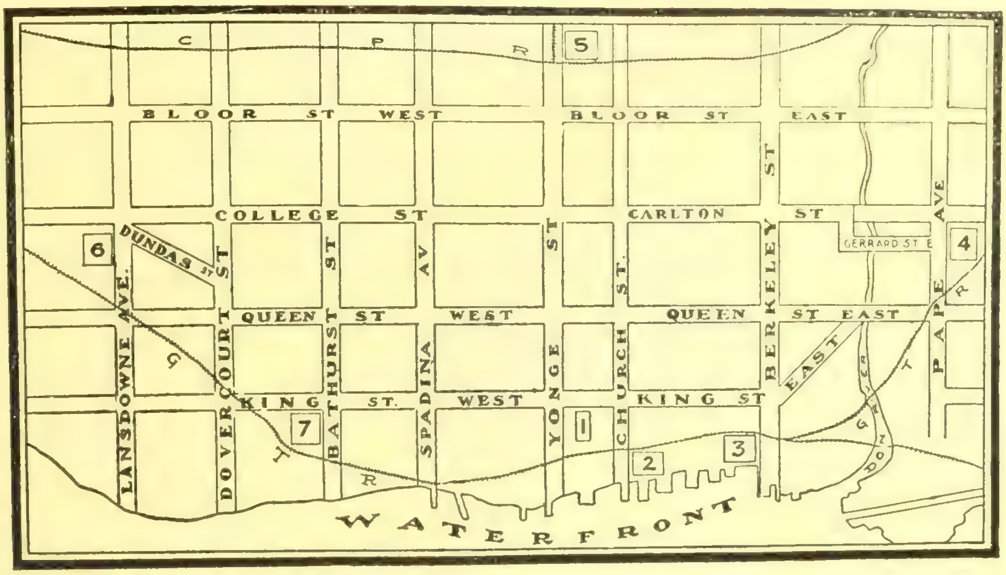

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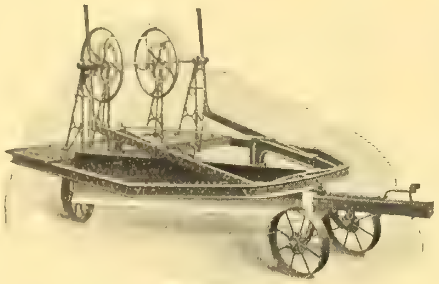

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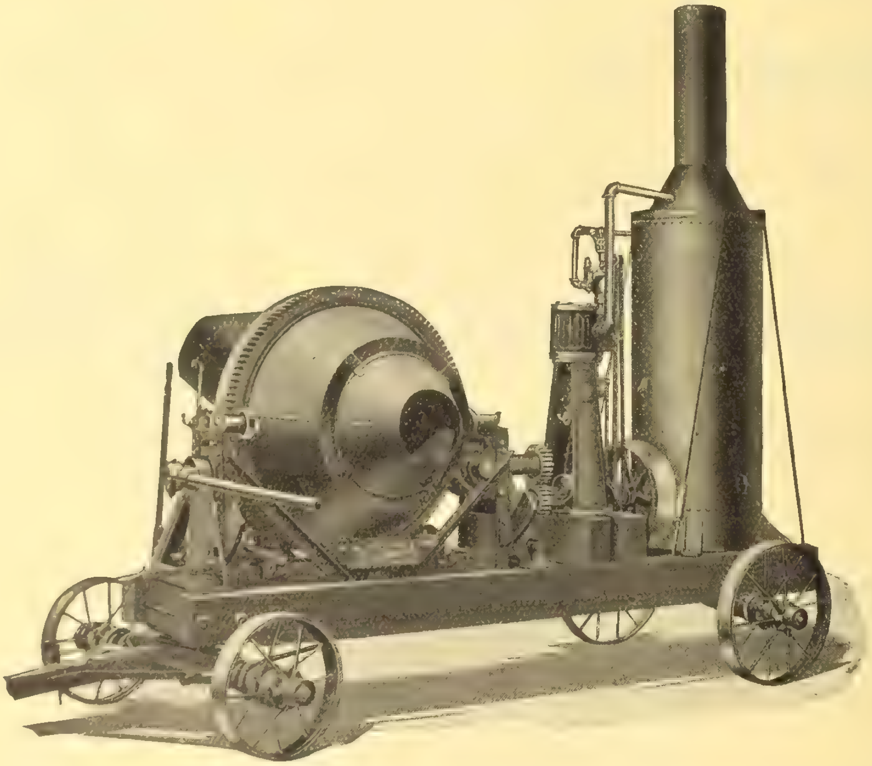

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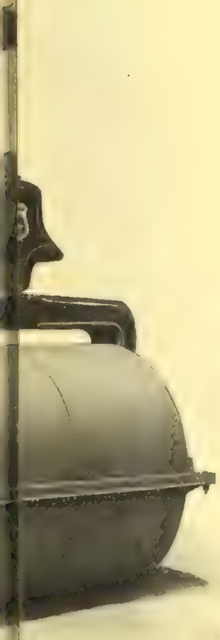

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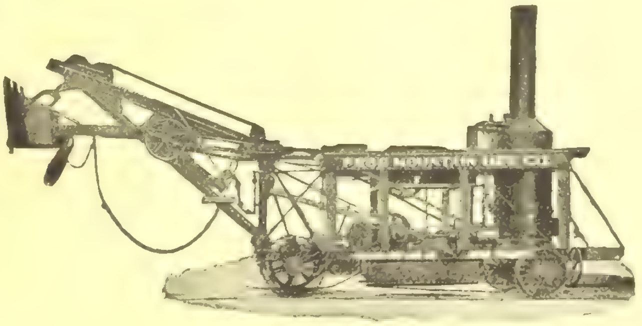

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Wholesome Lessons from Building Failures

The calamity at Montreal will doubtless prove a fruitful source of discussion later on when a further investigation has been made and more reliable facts are at hand. The feeling that has prevailed in all constructional quarters is, above all, one of intense sympathy with those connected with the disaster. Hitherto there has been a fine sense of delicacy and a general desire to refrain from making any insinuations, either by word or pen, that would tend to increase the cares of those connected with the work. Despite modern day progressiveness, and the tremendous strides that have been made in every branch of construction during recent years, we shall never be infallible. Buildings collapsed long before our day and generation, and it is pretty safe to predict that the calamity at Montreal will not be the last of its kind.

From every adversity, however, we should be able to take a helpful lesson. The Montreal affair is a notable instance. One of the first things that is emphasized by this calamity is the necessity for having the steel work supporting water tanks designed or checked by a properly qualified structural steel engineer. This is not intended and can hardly be construed as a reflection upon the architectural profession. It is an axiom. Although these water towers are apparently simple, their design is by no means so, for the reason that they constitute a class of structure quite different from the steel skeletons of buildings and bridges. The design of posts and cross struts for the former structures is another proposition entirely. The relatively small loads carried by these members gives rise to excessively light sections, having a slenderness ratio much above that of compression members in buildings and bridges. For this reason their design must be on the basis of their buckling strength rather than on that of their crushing strength. The ordinary formulas, therefore, do not apply. In such instances it is obvious that the only method of figuring such struts is by employing Euler's formula for long columns. The experimental investigations of Tetmajer and others show that slender struts such as are generally employed in light towers of the kind under consideration, possess a strength very closely approximated by Euler's formula.

Again, while the factor of safety on ultimate strength for windmill towers and transmission line towers is frequently as low as 2½, it should never be as low as this for towers supporting water tanks. In the case of the former structures the maximum stresses arise from the simultaneous effect of a number of conditions, but for water tank towers the maximum live load consists of the water and the tank and is supposed to be always present. It is not correct, therefore, to use higher working stresses for the dead load, live load and wind load than for merely the dead load and live load, since the dead load and the live load are always operating under low wind pressure or under the maximum wind pressure reached in the locality.

Lastly, the field connections should be rivetted and all members should be stiff members, i.e., angles and not rods. In no case should bolting be permitted, as this tends to make the structure flimsy.

A reflection that will surely come to many of our architectural readers is the unreliability of taking the plans of a building and, from an inspection of these, advising whether the walls or girders will carry the load of a sprinkling tank. The architect is only warranted in such a course when he has indisputable evidence that the work has been carried out according to the letter of the specifications, which in turn must bear expert examination. A case in point came to our attention quite recently. On a certain structure in Toroneo it was stipulated that the piers between curtain walls were to be solid brick, laid in cement mortar. Upon examination it was discovered that a shell of single brick had been made around the pier and the interior filled in with building rubbish, such as pieces of broken brick, lumps of old mortar, shavings, sticks and so on. It is apparent that if cases such as this were at all frequent, plans and specifications would be of little use for future guidance.

One is inclined to think that somewhat more stringent regulations tending to ensure the safety of structures during the process of erection and after their completion would be really in the interests of building. Within recent years not a few accidents have resulted from a nonobservance of some of the most fundamental principles of construction. This, of course, does not apply to the collapse at Montreal, for the investigations made have already shown that such principles were observed, but at the same time, one cannot help thinking that a revised code of regulations would in many places prove an enduring advantage to building interests.

New Water Supply System Fort William

Methods Adopted in Construction of Submerged Pipe Line under the Kaministiquia River Details of Organization and Cost*

By H. S. Hancock, City Engineer, Fort William

The river at the point of crossing is 330 feet in width and only one sounding revealed a greater depth than 25 feet. At this time the draft of boats operating beyond the proposed crossing to the coal docks of the Canadian Northern Railway did not exceed 17 feet, but before the work was completed the erection of a grain elevator and the establishment of a rail dock by the Grand Trunk Pacific Railway, developed a large traffic by ships drawing as much as 21 feet of water. This traffic was still further increased by tugs hauling scows to the dumping ground in the lake from the dredges working on the upper reaches of the river. The river has frequently a considerable current, and usually carries a quantity of alluvial matter in suspension. The water is naturally of a dark brown color, owing to its passage through the muskegs and swamps that abound at the head waters of the river. As a result 50 candle power lights can only be seen through it as a beacon at a short distance, and are of no value as an illuminant.

The bed of the river is covered by several feet of alluvial deposit and sand, overlying a bed of blue-gray clay, itself containing a small percentage of fine sand. Solid rock of uncetrain character is found at a depth of from 55 to 58 feet below water level. Overlying the rock is a bed of from 2 to 5 feet in thickness of gravel and small boulders, bearing water under a head that rises in the boring tubes some 4 or 5 feet above the surface of the river.

The question of a tunnel through the clay bed under the river was seriously considered, but it was decided that pipe lines would be sufficient for many years, and that this expenditure could be deferred until the growth of the city enabled it to bear the cost with less difficulty. Owing largely to an incomplete knowledge of the nature of the material to be encountered, this cost was originally thought to be much greater than will actually be necessary. It was also anticipated that pipe lines could be laid in a much shorter time, and the much needed temporary water supply more quickly obtained.

It was the writer's original intention, when the pipe line had been decided on, to dredge two channels and lay a duplicate main of hub and spigot pipe, with a flexible joint at every fourth joint, as sufficient until such time as a tunnel became necessary. The majority of the board of commissioners objected to the flexible joints and also to the ordinary lead joint for use under water. They wanted every joint under water to be a flanged joint, and were quite willing to bear any additional expense incurred by this method of construction.

The material for this work was ordered by the city from the D. Y. Stewart Company, of Glasgow, some weeks prior to the award of the contract.

A special Y-connection was made with the pressure main on the south bank of the river, and two lines of hub and spigot pipe carried at a diverging angle of 45 degrees with the centre line until the ends were 100 feet apart; 45-degree bends then carried the two pipe lines parallel 100 feet centre to centre to the bank of the river, where they dipped by a one-eighth bend at an angle of 45 degrees to a grade line 28 feet below the normal water level of the river. This grade was maintained for 300 feet on both lines, at which point 45-degree bends were used to bring them to the surface, where a duplication of the arrangement on the south bank connected them at a second Y with the 18-inch main leading to the city. Every joint under water was a flanged joint. The flanged pipes were 12 feet long, of standard specifications, $\frac{7}{8}$-inch thick, and weighing not less than 2,000 pounds per length. The flanges were $\frac{7}{8}$x3 inches, supported by ribs, and provided with 12 $\frac{3}{4}$-inch bolts on a bolt circle of $2\frac{3}{4}$ inches diameter. Corrugated copper gaskets were used for all flanger joints, after the turned faces had been thoroughly cleaned and lightly smeared with "manganesite" paste. Concrete cut-off walls were built around the pipes lying on both sides of every bend, as a support for the vertical bends and to resist the thrust tending to move the horizontal bends. Two 18-inch valves with spur gearing were placed close to the south Y and two laid flat with bevel gearing close to the north Y.

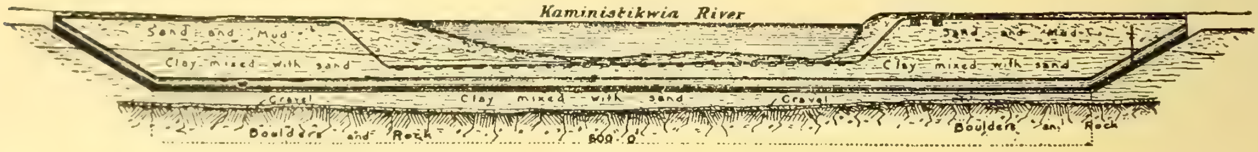

Fig. 1.—Submerged Pipe Line and Proposed Tunnel

For the purpose of protecting the pipe at the water line from frost and from the danger of contact with boats two 50-foot piles were driven 6 feet centre to centre, 18 feet from the points where the pipes emerged from the river, 6 feet nearer the shore, and 12 feet centre to centre, two more piles were driven, and two additional piles, 18 feet centre to centre, were driven close to the shore line. All these piles were securely tied together and into the bank with 8 x 12-inch walings and 12 x 12-inch internal cross bracing. Any tendency to slide into the river was overcome by attaching the whole structure to four $\frac{3}{4}$-inch wire ropes anchored to dead men 50 feet from the river bank. A second line of waling was sunk on the inside of the piles at a depth of 6 feet; 3 x 10-inch sheet piling was then driven on the inside of the walings around the frame thus formed, and the enclosed space backfilled to an elevation 3 feet above the top of the pipe.

The specifications allowed the contractor considerable latitude as to the method to be adopted in laying this pipe. The essentials were that it be laid to grade on a solid bed; that it should bear a test pressure of 200 pounds per square inch; that the contractor should bear all loss from breakage or damage, until the final acceptance of the work, and the method of laying adopted was to be entirely at his own risk. He was also to provide all necessary appliances for laying the pipe, drive all necessary piling and furnish a satisfactory and permanent support for the pipe.

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*Extracted from a comprehensive and interesting paper presented to the Canadian Society of Civil Engineers.

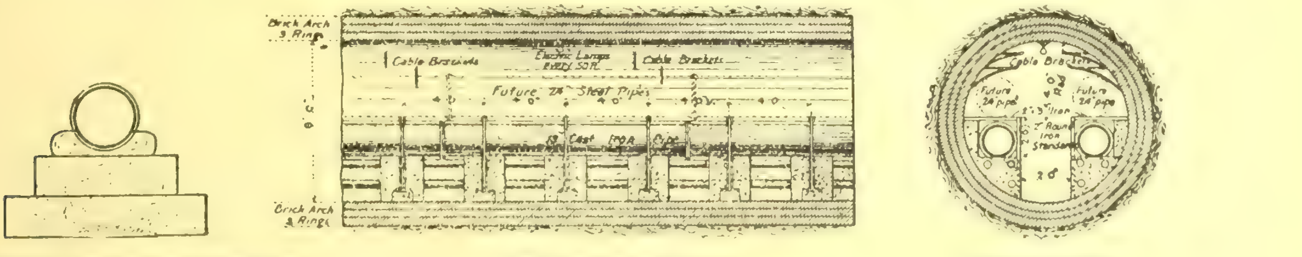
This somewhat indefinite clause was almost forced on the writer by the very short time available for the production of the specifications and lack of time and opportunity to test some of the unknown factors in the problem.

Deferred delivery of the pipe delayed the commencement of this section until late in the summer. A subcontract was let to the Great Lakes Dredging Company, of Port Arthur, the only company in the district at that time possessing the necessary dredges, scows, and diving outfit, and it placed an experienced diver foreman in charge of the work. The original soundings indicated that the solid clay foundation would be secured at the required depth. Two trenches 15 feet in width were dredged across the river to a depth of 28 feet below water level. The bottom of the trench was carefully prepared by a diver, assisted by careful measurements, and a firm level clay bed reported. Four lengths of pipe were then bolted together on the bank and lowered into a position by a hoist operating over the leads of a scow pile driver. Thus every fourth joint was made by a diver under water. Before the first pipe line was completed the writer contracted typhoid fever and tests were deferred until his recovery.

Some of the bends had failed to arrive before winter set in, for which the contractor was not responsible, and it was necessary to extend the time of completion to the spring. The west pipe line had, however, been laid across, and the most elementary tests proved it to be defective. The sub-contractors objected to doing any work during the winter, claiming, with justice, that the city had failed to supply pipe within the time contemplated by the contract. They finally, however, got their diver working, and just before the ice broke up, got the line in such shape that the loss could be approximately measured as not less than 2,000 gallons per minute at a pressure of 125 pounds. Immediately after the ice had left the river they made further attempts to improve the line by tightening the joints. The failure of their force pump and the impossibility of procuring another, led, pending its repair, to the use of the pressure from the reservoir for temporary testing.

One of the joints on the banks invariably blew out under this treatment, and some weeks were consumed in fitting a sleeve on this joint. When this had been fixed, gauges on opposite sides of the river showed a pressure loss in the crossing of 3 pounds, and it was quite obvious that the joints under water were so badly made that the whole pipe line must be moved to effect a closure. The contractors were therefore notified that the pipe line must be taken up and relaid. They then took the position that the material supplied by the city was defective and that a tight joint could not be made with copper gaskets. This latter statement was easily refuted by an object lesson on the bank. The sub-contractors were in a rather strong position, as they owned the only available equipment within a large radius. However, after several weeks of acrimonious negotiation it was arranged that the chief contractors were to take over the work from the sub-contractors and that the latter would supply the necessary equipment at an agreed price per day. The chief contractors then arranged for the writer to directly handle the work, they to pay all costs.

Examination by an independent diver revealed the fact that, contrary to the report of the sub-contractors' diver, a clay bed had not been secured, and that there were holes filled with unsatisfactory material in the trench, varying from 1 to 3 feet below grade, and in some cases extending over three or four pipe lengths. There was a slight deflection either up or down at each joint made under water, and some bolts were missing and others were loose. Work was commenced by raising the east pipe line, three lengths at a time, care being taken that the joints that had been made under water should not be disturbed until they had been examined on the bank. This bank inspection revealed the fact that the previous diver, in his efforts to stop the leaks, had driven wood wedges between the flanges, forcing the copper gasket into the centre of the pipe.



Section thro' Pipe showing Concrete Seat

Part Longitudinal Section

Transverse Section

Fig. 2 Details of Submerged Pipe Line and Tunnel

There being no effective hydraulic dredge on Thunder Bay and the dipper dredges in service only working to a depth of 29 feet, it was impracticable to lower the grade line for the purpose of securing a firm bed, and it was decided to support the pipe throughout its length. The obvious solution was to drive a double row of piles and support the pipe on the caps joining the two rows. Suitable materials and equipment for this form of construction were, however, not available, and the following was adopted in lieu of it:

Concrete blocks, 1x3x5 feet, were cast on the bank, reinforced with four bars of ½-inch round steel each way. Two ¾-inch inverted U-pieces of iron, with the points of the U hooked around the reinforcement, were placed in each block, so that when set two loops were exposed at either end of the block for the reception of the hooks of the hoisting chain. These blocks were laid at 12-foot centres, supporting the centre of each pipe. Often large quantities of silt had to be removed from the trench in order to reach clay. An 8-inch centrifugal pump was first used, with little success. Finally, two No. 4 Edson diaphragm pumps, attached to two lengths of hose, were found to work admirably.

Further assistance was furnished from a 2-inch hose with ¾-inch nozzle, supplied with water from the reservoir at 125 pounds pressure. The diver directed the ends of the hoses and nozzle. When solid clay was reached and a bed levelled by excavation, a block was lowered and levelled by means of a 20-pound plumb bob if the final elevation of the block was more than one foot below grade, a second block, 4 feet in length, was laid on the first, leaving a 6-inch step.

In three cases, three blocks were necessary to raise from solid clay to within 12 inches of the grade line. The elevation of the top block was then carefully measured, and a piece of flat, slaty rock of the necessary thickness was laid on the block to act as a temporary support for the pipe. A single pipe was then sent down and bolted up. A rich concrete of fine gravel was lowered in long sacks and worked between the pipe and the top of the block. The ends of the sack were padded up, so that when the concrete had set the pipe was supported by a cradle formed to the shape of the pipe. A blind gasket of ⅜-inch boiler plate was bolted to the open end of the pipe, and the whole line up to that point tested. A small hand force pump was the only pump available, and it refused to do better than 120 pounds per square inch. Ninety pounds was, however, easily secured after the pipe became full, the pump leaking badly above that pressure.

If there was any fluctuation in the time required to raise the pressure, the last joint laid was carefully gone over until the best test was secured within the capacity of the pump, this capacity being checked on four lengths bolted together on the bank. Every joint was in this way tested under water. When the line was completed, a ¼-inch pipe from the pressure main was led through a blind gasket at the shore end of the river pipe. With the cock slightly turned, the river pipe held the same pressure, during a 24-hour test, as the pressure main on the shore side of the gate valve at the same elevation, or approximately a pressure of 125 pounds.

As concrete blocks were not considered in the original contract, an extra was allowed the contractor for this portion of the work. The personnel of the gang was as follows:

Foreman, at $8 per day	$ 8.00
Diver, at $10 per day	10.00
Two helpers, at $3.50 per day	7.00
Hoistman, at $4 per day	4.00
Six laborers, at $2.50 per day	15.00
One diving suit, at $10 per day	10.00
One scow and hoist, at $15 per day	15.00
Total per day of ten hours	$69.00

A record was kept of the time spent in excavating for and placing the blocks, and resulted in the city paying the contractors $747 in addition to supplying the blocks. Thirty-five blocks were laid on this line under the horizontal 300 feet of pipe on the river bottom, and as each block cost $4, the charges for material and labor amounted to $887, or $2.95 per foot.

The large river traffic greatly increased the cost of the work. The pipe lines were located at a bend in the river where light boats in a wind were swung over a wide range, and during the work in the middle of the river the passage of every boat meant a cessation of operation and the hauling of the scow well toward the shore line. This feature alone probably doubled the time spent on the work.

The summer was drawing to a close when the first line was completed and put in operation. It was therefore deemed advisable to defer the relaying of the second line until the river was frozen over. Work could then be conducted from the ice and the delays due to navigation avoided, these advantages promising to more than offset the difficulty of working in very cold weather.

Prior to recommencing the remaining portion, however, a settlement was effected between the contractors and the city, by which the latter took over the work for an allowance of $2,500, its estimated cost, exclusive of blocks. When about half completed in January, 1908, the Dominion Government announced its intention of dredging the river to a depth of 25 feet and a width of 500 feet, in the course of a five-year programme. In view of this, the advisability of abandoning the pipe line and driving a tunnel was seriously considered. However, the low position of municipal bonds in the market at that time indicated that it would be sound finance to complete the pipe line and drive the tunnel at some future time within the five-year limit set for government operations, when the financial conditions would probably be more favorable. The second line was then completed at a total cost, including blocks, of $3,180. A slide at the north bank and an unexpected accumulation of sunken logs caused much trouble, but the cost only slightly exceeded expectations.

It is probable that a tunnel will be driven next year. While the main reason for this step is the contemplated widening of the harbor, it has become more necessary because of the rapid approach to a population of 30,000, foreshadowing the necessity of additional pipes, and to the fact that all large boats, in making this bend in the river, drag anchors if there is any wind, thus placing the pipes and cables (light and telephone) in constant danger.

Injury to the power cable seriously crippled the work on the Loch Lomond tunnel, and in November last a boat dragging a large fluke anchor picked two lengths of pipe from one of the lines and carried them up the river. Both pipes were broken close to a flange, the remainder of the line remaining intact. The pipes carried away were Nos. 5 and 6 from the south bank. The flanges between pipes 4 and 5 were left, but the flanges between pipes 6 and 7 were carried away. Pipe 5 was replaced by an ordinary flanged pipe, and pipe 6 by one with a flange at its junction with No. 5 and spigot end to join 7. The joint between 6 and 7 was then made by a special sleeve, 24 inches long, grooved and leaded and caulked under water with shredded lead. The pipe line is apparently as good as ever, having been in continuous operation since its repair.

The tunnel is to be 8 feet internal diameter, lined with three rows of brick. Three concrete benches, 2 feet wide, will support each 12-foot length of the first double line, either 18 or 24-inch pipe. A second double line can be laid above the first when necessary on a steel staging. Conduits for cables will be placed in the benches, and additional racks provided above the pipe. The Kaministiquia Power Company expects to carry its cables in the same tunnel in order to furnish power to the Grand Trunk Pacific Railway terminals and elevators.

As a protection against accident, large notice boards were erected on both sides of the river warning navigators not to drag chains or anchors. Similar boards warning navigators of the presence of the pipe were placed 400 yards up and down stream from the crossing. All boards are illuminated at night by red and white lights.

The cost to the city of the river crossing was as follows:

City Expenditure on River Crossing:

On pipe for river crossing	$ 5,317.00
Valves for river crossing	628.00
Gaskets for river crossing	134.00
Labor on second line—pipe	2,670.00
Labor on second line—blocks	892.00
Cost of blocks, extra pipe, etc.	584.00
Pile driving and bank protection	415.43
Total	$10,640.13

The Lindsay Ozone Plant

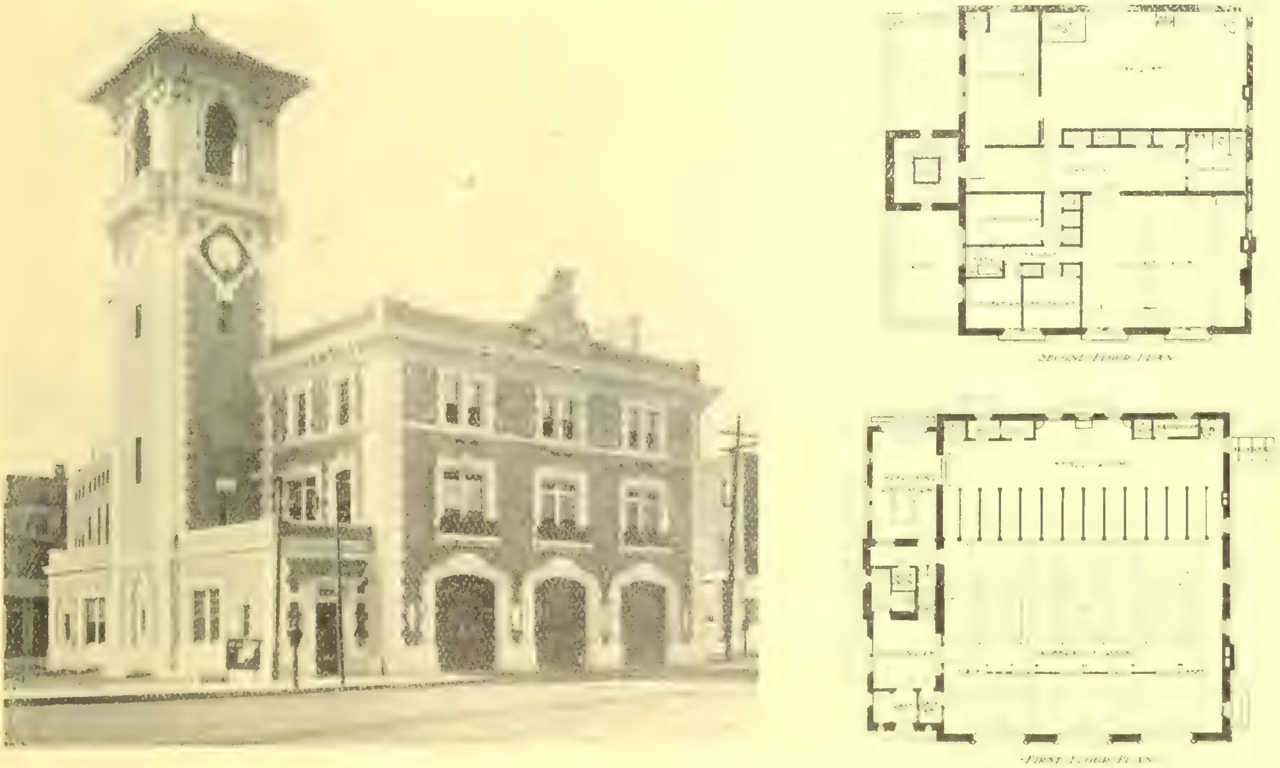
Apropos of the report issued by the Provincial Board of Health in the above connection, the "Engineering Record, in a leading editorial upon the subject, published June 11th, expresses itself in part as follows:

The results of the tests conducted by the Provincial Board of Health indicate that the free ammonia in the raw water averages 0.022 parts per million, and in the filtered and ozonized water it is 0.023. The change in the albuminoid ammonia is from 0.238 to 0.228; that in the nitrates and nitrites is from 0.129 to 0.163. There is no change in the color, the total hardness is somewhat increased and there is no change in the oxygen consumed. A detailed examination of the figures in the report, which it is unnecessary to give here, shows that the ozone has done absolutely nothing in the purification process, speaking chemically. From a bacteriological point of view the filters removed 30 per cent. of the bacteria in the raw water, and of the remaining bacteria the ozone in the water removed 8 per cent., giving a total reduction of only 35.8 per cent. These figures show that the plant is not as efficient as a well managed roughing filter, and indicate the absurdity of relying on such a plant as a protection against water-borne diseases.

The conditions found by an examination of the plant prove clearly that equipment of this character must be designed and installed with the greatest care, otherwise it will fail to work. Ozonization has proved successful in a number of places, but it is by no means a cheap process. The manufacture of the ozone is not particularly troublesome, but the proper mingling of the ozone and the water is difficult of attainment, and it is understood that at some places in Europe, where ozone plants are operated for water sterilization, the mechanical expense of forcing the ozone into contact with the water is heavier than the cost of producing the gas itself. At Lindsay, while ozone was actually produced, as before stated, although in a crude fashion, there was practically no mingling of the gas and the water. The aspirators which were relied upon to introduce the ozone into the water were so inefficient that no current could be detected in the pipe conducting the ozone from the generating apparatus to the aspirators. Apparently enough ozone was generated at the plant to sterilize the water, but practically none of it ever entered the water.

Attention is called to this plant and the results of the tests of it because the sterilization of water is now passing through one of those stages which recall to mind the condition of water filtration some 20 years ago. Undoubtedly ozonization, properly conducted, will prove very effective, but it is, so far as we know now, a very costly process. In order for it to be successful at any price the apparatus must be designed very carefully, so as to ensure certainty of action, and in the best plans all parts are duplicated so that a failure of any one part will not require the shutting down of the plant. Moreover, the actual operation of such a plant requires careful supervision. The fact that Dr. Nasmith's assistant nearly lost his life in the course of the tests at Lindsay is a pretty good indication of the dangers to which even an experienced man is subject when ozone does not go where it is expected to. In short, this form of sterilization, while valuable as another resource of sanitary engineering, is apparently something for specialists alone to prescribe and operate.

Satisfactory Plan for City Fire Department Building



Reproduced from the plans of Messrs Freeman & Wilcox for Firehall at Brookline, Mass.

The Ancient Brick

The preparation of dried bricks in days gone by, said Mr A. B. Searle in a recent lecture at the Royal Society of Arts, involved a large amount of physical labor, as the clay paste had to be beaten into a mass a few inches thick, and then trodden until it become homogeneous and uniform in composition. This was the method employed by Egyptian brick makers, and was still used in many important steel works in the manufacture of bricks for special purposes. The greatest discovery of the ancient Egyptians was the introduction of chopped straw, the primary object of the use of which is twofold: (1) to enable the workman to develop the distinctive nature of the clay paste and obtain maximum plasticity; and (2) the insoluble portion of the straw taken from the liquid used in making the paste served as a non-plastic medium, which enabled the bricks to dry without cracking. An American engineer discovered this five years ago. In the light of this knowledge the full extent of the punishment of the Israelites, when they were ordered to make bricks without straw, could be realized, for it meant they had to make from one and a half times to twice as many bricks to get the same result. Whereas the Egyptians in their moulds only made one brick at a time, Central Americans used to make several. In the latter case, a rough wooden frame about 24 inches long, 24 inches wide, and 9 inches thick, with a partition across the middle, was used. This was filled with paste, and when removed, left two bricks, about ½-inch apart. Even so the process was a slow one, and a man seldom made more than 150 bricks per day. The bricks were allowed to remain in the air until sufficiently dry, and were then turned on their edges for the sun to beat upon them. Such bricks, under favorable conditions, would last for a long time; indeed, in the absence of frost or moisture they would last indefinitely.

Calcium Chloride for Laying Dust

Calcium chloride for laying dust was used at Boston in 1908 under a contract with the Calcide Process Company for treating 268,000 square yards of macadam roadway, according to the last annual report of Mr. Guy C. Emerson, superintendent of streets. The price paid for five months was 4 cents per square yard. The chemical was brought to the roadway in 600-gallon carts filled with a concentrated solution of 40 per cent. calcium chloride, which was then emptied into five cans, each holding about 110 gallons, which were distributed along the stretch to be treated. In using the chloride the contents of one 110-gallon can was emptied into the 600-gallon cart, which was then filled up with water. This 600-gallon charge of the diluted solution covered about 1,900 square yards of roadway, so that 10 loads were sufficient for a mile of 32-foot roadway. During the first week in which chloride is used two applications are made, and thereafter the solution is applied on the average at 21-day intervals. The results of this treatment, according to the report, have been very satisfactory; no odor resulted, and the road surface was said to have been in much better condition at the end of the season's treatment than at the beginning.

The Vancouver carpenters had a celebration recently on the occasion of the golden jubilee of the Amalgamated Society of Carpenters and Joiners, which was organized at London, Eng., in 1860.

Good Roads Convention at Winnipeg

Plans have been made for the proposed Good Roads Convention to be held at the Winnipeg Industrial Exhibition. The actual sessions of the convention will be held on Wednesday, July 20th, commencing at 10 a.m. There will be headquarters open during the entire week of July 18th, with a representative of the Manitoba Good Roads Commission in charge. The speaker on July 20th will be Mr. A. W. Campbell. Those interested in the movement are considering the question of building a section of model macadam roadway at the exhibition grounds as an object lesson to visiting delegates. Every municipality in Manitoba will send two delegates to the Good Roads Convention.

News from the Wheat Fields

The greatest encouragement is to be derived from the crop reports that continue to come in. The C.P.R. has issued a report covering its widely extended system in the west, which shows, generally speaking, weather favorable and growth rapid.

In southern Saskatchewan, Yorktown district, Edmonton section and Moose Jaw section, abundance of rain is reported, with gratifying growth.

The general report gives evidence that prospects generally are regarded as better than ever before for a record-breaking crop.

The union carpenters in Fort William and Port Arthur, numbering 600, went on strike for an increase from 35 to 40 cents an hour.

Portage La Prairie, Man., is complaining of a shortage of bricklayers. The town is experiencing a particularly active building season.

The building permits issued at Edmonton, Alta., during May totalled $220,000, as compared with $368,000 for the corresponding month of last year.

Hon. William Pugsley states that plans for the new departmental block in Ottawa will not be reconsidered owing to objections made by several architects, but will be proceeded with on the lines proposed. Tenders will be called for this summer.

Building operations at Portage la Prairie are more active now than they have been since the boom of '82. A feature of the situation in the city is the number of new industrial concerns that are building factories. Scores of new residences are also going up.

Toronto is to be congratulated upon the appointment of a special committee of the city council to control and manage the water front. It is reported that the Commission has under consideration a number of important improvements in regard to the erection of docks at the east end of the harbor and the extension of wharves.

The 400 employees of the Government Printing Bureau at Ottawa have been feeling somewhat uneasy, in view of the terrible disaster to the Montreal Herald. Between 500 and 600 tons of type and paper are stored in a five-storey building, on the lower floors of which men are always busy on linotype machines. The matter is being taken up by the Allied Trades and Labor Association.

Vancouver's First Reinforced Concrete Apartment Block

The apartment building to be erected at Vancouver for the Hose Investment Company of Vancouver, is the first reinforced concrete structure for this class of building to be erected in the Pacific capital. The building contains 22 4-room suites, each of which contains bedroom, parlor, dining-room, kitchen, private hall, pantry, bathroom and balcony. There will also be 10 3-room suites, each comprised of living room, bedroom, kitchen with fitted pantry, and private hall. The janitor's apartments contain a parcel room and office adjoining the trades entrance. In the basement there will be a laundry and baggage room for tenants. A vacuum cleaning system will be installed for hallways and for each suite of apartments.

The structure will be of rusticated concrete walls to the first floor with brick facing over.

The New Apartment Building of the Hose Investment Company, Vancouver, B.C.

The general contract has been awarded to Adkison & Dill. Other contracts include: steam heating and plumbing (Standard Ideal fixtures), W. S. Ramsay; conduit wiring and telephone system, Electrical Construction Company; gas stoves (Ideal), Burnside Gas Appliance Company; passenger control elevator, A. & P. Steven, Glasgow, Scotland.

The superintendent for the work is Mr. B. S. Edwards, the building being erected according to plans and under supervision of Mr. Arthur J. Bird, Winch Building, Vancouver. The estimated cost is $80,000.

Finding the Length of Rafters

It very often happens that when a carpenter or contractor is figuring a set of plans that it is necessary for him to know the length of rafter that will be required. This information is most needed when the carpenter is called upon to make out a bill of material from floor plans and has absolutely nothing at hand to show him what length of rafters will be required. If he cannot figure the length of rafters required then he cannot tell what length to order, the amount of sheathing and shingles for roof, etc. It is merely a guess if he does not understand how to figure.

It is the same with hips and valleys, there are many who cannot readily determine the length of hips and valleys from plans. All this is easy by figures and we will put our brother carpenters next to this important knowledge in the building trade. We will take it for granted that our readers are familiar with square root, for that is the method by which the lengths of rafters are obtained by figures or mathematically, and the method is absolutely correct to the smallest fractional part of an inch.

For example, we will take a building 24 feet wide with a one-third pitch and figure the common rafter length. It is generally conceded that a one-third pitch is a rise of roof equal to one-third the width of the building, which in this case will be 8 feet. The run of rafter is from the plate line in to a point plumb under the top cut of the rafter and which in this case is 12 feet, hence we have a 12-foot run and an 8-foot rise to find the length of common rafter. The problem now assumes the shape of a right angle triangle, with the base 12 feet and perpendicular height 8 feet, and from these figures we can find what is termed the hypotenuse and which would represent the length of rafter. The hypotenuse is equal to the square root of the sum of the squares of the other two sides, namely the base and perpendicular, hence we have by figures $12 \times 12 = 144$; $8 \times 8 = 64$; $64 + 144 = 208$, and the square root of 208 feet = 14.422 feet, length of rafter.

It will be noticed that our answer is in feet and a decimal of a foot. To reduce this decimal to inches so we can readily apply it to the rafter length, simply multiply the decimal $.422 \times 12$ inches, because 12 inches make 1 foot, and we have 5.062 inches; now the decimal part .062 represents a thousandth part of an inch and is really less than one-sixteenth, so we can discard this and we have 5 inches, thus the length of rafter is 14 feet and 5 inches.

Now, suppose we wanted to find the length of a hip or valley for this same roof with the same pitch and same run to correspond with the common rafter, the process is much the same, the rise in roof is the same, but the run of the hip or valley will be the diagonal of a 12 x 12 triangle; so we simply take twice the square of 12 and add the square of the height; thus 12 x 12 x 2 = 288, 8 x 8 = 64, and 288 + 64 = 352, and the square root of 352 = 18.761, the decimal .761 = $9\frac{1}{8}$ inches, very nearly. Thus the length of a hip or valley to correspond with the common rafter would be 18 feet, $9\frac{1}{8}$ inches, and in ordinary practice the $\frac{1}{8}$-inch could be disregarded.

For the benefit of those who are not versed in square root we will give the length of common rafter in feet and inches for one foot run and the corresponding hip or valley for the pitches most in use, then it is only a matter of simply multiplying the length of rafter for one foot run by the number of feet run to find the length of rafter required:

Pitch of roof Rise Run	Length Common Rafter 1 foot Run		Length Hip or Valley 1 foot Run	
	Ft.	In.	Ft.	In.
6 x 12	1	1 7/16	1	6
7 x 12	1	1 7/8	1	6 3/8
8 x 12	1	2 7/16	1	6 3/4
9 x 12	1	3	1	7 3/16
10 x 12	1	3 5/8	1	7 11/16
12 x 12	1	5	1	8 13/16

We will now take our figures for a one-third pitch and see how it will figure out in the building in question. Take the figures for one foot run common rafter, 1 foot, 2 7/16 inches, and multiply by 12 foot the run of rafter and we have 1 foot x 12 = 12feet; 2 7/16 inches multiplied by 12 = $29\frac{1}{4}$ inches, which is equal to 2 feet, $5\frac{1}{4}$ inches, length of common rafter. It will be seen that this varies only $\frac{1}{4}$-inch in 12 feet, from the square root method, and is about as close as the average roof would ever be framed, even by the experts.

Now, we will take the hip figures for a foot run. I foot, $6\frac{3}{4}$ inches and multiply by 12 feet the run of common rafter and we have 1 foot x 12 = 12 feet, and $6\frac{3}{4}$ inches multiplied by 12 = 81 inches; 81 inches equals 6 feet, 9 inches, which added to the 12 feet makes 18 feet, 9 inches, length of hip rafter, differing only $\frac{1}{8}$-inch in a 12-foot run from the square root solution and we believe the figures we have given are so nearly the mark that they are perfectly safe to be used either for estimating and making out bills or for the framing of the roofs.

Materials Required to make Concrete Brick

For brick of the ordinary class use 600 pounds of Portland cement and 40 cubic feet of sand and fine gravel; for fine face brick use 800 pounds of cement and 40 cubic feet of torpedo sand; for a cement brick, equal in every respect to the pressed brick of commerce, use 1,000 pounds of cement and 40 cubic feet of torpedo sand.

The following figures are also of interest:

A 1:3 brick takes 3.8 barrels of cement and 1.7 cubic yards sand per M.

A 1:4 brick takes 3.05 barrels cement and 1.8 cubic yards sand per M.

A 1:5 brick takes 2.55 barrels cement and 1.18 cubic yards sand per M.

A 1:6 brick takes 2.18 barrels cement and 1.9 cubic yards sand per M.

A 1:7 brick takes 1.9 barrels cement and 2 cubic yards sand per M.

An exchange gives the following method of testing sand for cement:

"The best practice requires that sand shall be suitable silicious material, passing a $\frac{1}{4}$-inch mesh sieve, clean, gritty and free of impurities. A good test of sand is to rub it between the hands, using considerable pressure. The sharpness of the grains and the absence of foreign material may both be determined in this way."

Ventilation of School Rooms

The uniform distribution of air is one of the most difficult problems connected with ventilation, says the "Engineering Review." This difficulty does not arise from the inability to introduce a definite volume of air into a given space in a certain specified time, but in the prevention of the formation of air currents and eddies which interfere with efficient ventilation. Intimately associated with this question of uniform air distribution is the one of warming the incoming air sufficiently to prevent a sensation of chilliness on the part of the occupants of the room.

Prof. R. C. Carpenter in his book, "Heating and Ventilating Buildings," says: "It is quite generally agreed that the velocity of the entering air should not exceed 4 to 6 feet per second, unless it can be introduced in such a position as to make an insensible current."

Professor Carpenter further says:

"A most effective location for the air inlet is probably in or near the ceiling of a room. The advantages of introducing warm air at or near the top of the room are: (1) The warm air tends to rise and hence spreads uniformly under the ceiling; (2) It gradually displaces other air, and the room becomes filled with pure air without sensible currents or draughts; (3) The cooler air sinks to the bottom and can be taken off by a ventilating shaft.

"So far as the system introduces air at the top of the room, it is forced distribution, and produces better results than other methods.

"The outlet for air should be as near the bottom of a room as possible and it should be connected with a flue of ample size maintained at a temperature higher than that of the surrounding air, unless forced circulation is in use, in which case, the excess of pressure in a room will produce the required circulation.

"The conditions as to size of the outlet register are the same as those for the inlet."

Prof. S. H. Woodbridge in a pamphlet on "Schoolhouse Warming and Ventilation" states:

"The location of outlets and the concentrated or diffused movement of air through rooms are the chief determining factors of the problem of heating and ventilating. The location of the fresh and warm air inlet is of less moment than that of the outlet. It is wholly unnecessary to carry the entering air by flues to the vicinity of the outer walls. . . . The best location for the inlet is upon the inner wall at a point that shall be central with reference to the outside wall or walls."

An agreement between the employing plasterers and the Plasterers' International Association, local No. 334, to extend over a period of nearly two years, was signed at Winnipeg last week. The plasterers are at present paid 50 cents per hour, the rate which has prevailed for the past six years, and the new arrangement is that from June 1, 1910, to March 31, 1911, the rate will be 55 cents per hour, and from April 1, 1911, to January 31, 1912, it will be 60 cents.

The city of North Vancouver invited Mr. R. H. Thomson, city engineer of Seattle, Wash., to submit a plan for certain improvements, including a general regrading of the city. The mayor of Seattle, however, thinks that the salary of $7,500 a year, which Mr. Thomson is now drawing as city engineer, is quite sufficient for an ordinary man, and refuses to let him submit a report for North Vancouver unless it is done gratis. At this rate North Vancouver will never see that regrading. United States engineers are not particularly philanthropic.

The Calamity at Montreal

Details of the Occurence and Substance of the Investigations—Special to the Contract Record

On Monday, June 13, an hour before noon, the five-storey building occupied by the Herald Company, Limited, facing Victoria Square on St. James street, was, without a moment's warning, almost totally wrecked, the front walls and portion of floors along remaining intact. Within a short time of the first disaster, fire broke out, causing further destruction. A water tank weighing about 60 tons for use in connection with a water sprinkler system for fire protection, was precipitated from its position on the roof. Whether the accident was occasioned by the weakening of the tower supports or was due to supporting walls giving away is yet to be determined.

The civic authorities have called upon Messrs. J. L. Allison, representing Messrs. Ross & Holgate, W. H. Hutchison, the well known architect, and J. A. Jamieson, a prominent Montreal elevator contractor, to make a thorough investigation of the wreckage with a view to ascertaining the reasons for the catastrophe and if possible to fix the responsibility. These gentlemen are at present engaged on this task and will spare no effort to secure a thorough report.

In the meantime a coroner's jury has been empanelled and much interesting evidence pertaining to the case adduced:

Mr. John S. Archibald, of Messrs. Saxe & Archibald, the architect who prepared the plans for the remodelling of the building in 1905, stated that he had prepared plans for the alterations to the building. The water tank, with a capacity of 12,000 U. S. gallons, was situated on the roof and placed in such a manner that out of a total weight of 60 tons, 40 tons were supported by a centre wall of brick, 12 inches in thickness, while the balance, 20 tons, was carried by the eastern wall. The weight supported by the roof was 40,000 pounds. The civic by-laws allowed a weight of 46,800, the margin of safety being 16 per cent. in this case. Continuing, Mr. Archibald said that he had examined the tank on Dec. 7, 1905, to see if there was any ice in it. The tank was again examined in October, 1907, and found to be all right. In June, 1909, there had been a small fire on the roof, and after that there had to be some repairs made, and it was then found that the supports of the tank were strong. In September last the repairs were finished and all was found to be in good order at that time.

Mr. Archibald stated that the centre wall was finished level with the roof and that it was strong and quite plumb. The steel on the tank, he was satisfied, was good or it would not have stood so long. The examination which he had made of the building since the disaster had convinced him that it was not the fall of the tank which had caused the catastrophe, otherwise the tank would not have fallen in a place 50 feet southwest of that which it had occupied on the roof. If the tank had fallen first it would have gone down due west.

The Steel Girders which supported the Tank.

Mr. J. S. Brierly, president of the Herald Company, was next examined. He stated that the tank was erected about five years ago. He could not say exactly who had built it, but all the work was entrusted to W. J. McGuire & Company, under the control of Saxe & Archibald, architects. There had been no reports from either contractor or architects that had hinted at any danger of the collapse of tank. Witness

Collapse of Flooring.

Front View after Disaster.

Rear View 1st and 2nd Floors.

could not state whether a permit for its erection had been taken out or not.

Mainly, the rest of the evidence was descriptive of the work of erecting the water tower. The superintendent of the work corroborated the report that no permit had been obtained from the city authorities for placing the tank. He said he had never known such a tower to be placed over two walls so widely separated. The distance was 31 feet. The beams bearing the tower rested on the centre wall and pierced the east wall. It was generally declared that the centre wall was one of solid brick, but at the close of the session a reporter informed the coroner that his examination of the ruins had shown that the wall was not solid, but that it rested at each floor on timber beams. After this new phase of evidence, it was decided to have an expert examination made of what remains of the centre wall, and the inquiry was adjourned.

Mr. A. Chausse, building inspector, says the weight of the tank was not responsible for the accident. Its overturn must, he thinks, have been caused by some outside force. No permit for the construction of the tank has been found, and Mr. Chausse says there cannot be one, because he would not have allowed it to be issued, as the law does not provide for this.

The Wrecked Herald Building—Note Dividing Wall upon which rested Supports of One Side of Tank.

In the light of the catastrophe in the Herald Building, it is interesting to recall that the executive of the Builders' Exchange three years ago made an urgent demand to the City Council for the immediate institution of a general system of inspection of roof tanks throughout the city. The committee was asked to appoint expert inspectors.

The Municipal Construction Company, of Vancouver, is making good progress with the contract of laying some 50 miles of water mains and connections in South Vancouver. The work was started about Feb. 1st. The wire-wound wood pipe is being made in the company's factory, and the quality is highly spoken of by the inspector.

Workingmen's Apartments, Montreal

A new departure in dwelling houses for working men is being made in Montreal. Lieut.-Col. J. Carson is erecting a block of apartments on Colborne street, especially adapted for this class of tenant.

The plan is arranged in four blocks of buildings, surrounding a rectangular court. In all there will be 50 suites or houses. Each house is planned to be self-contained on one flat. The accommodation will consist of a living room, kitchen, two bedrooms and a bathroom, containing a toilet, hot and cold water, lavatory and bath.

The buildings throughout will have fireproof basements with concrete floors, ceilings, etc., and will be used for storage purposes.

The dwelling apartments will be two storeys high. Each upper apartment will have a gallery looking out on the courtyard. Two stores have been provided for on Colborne street front.

In the finish of these houses, it has been considered sanitary and economical to include hardwood floors throughout, also fine ash trim.

The exterior walls will be lined with hollow terra cotta blocks. This ensures warmth in winter and coolness in summer. The entire exterior brick work will be the best quality plastic brick of plain design, giving the whole a substantial appearance.

It is the intention of the proprietor to supply the tenants with light, heat, hot and cold water and gas for cooking purposes. Accommodation for these supplies has been arranged for in a portion of the basement in the rear of the block, in which the necessary boilers, furnaces, meters, etc., have been placed. Ventilating flues to each kitchen and throughout basement have been provided for.

The courtyard and the private streets surrounding the block will be finished in concrete.

The necessity for such a class of building has been long felt in the neighborhood, and it is thought that there will be no difficulty in obtaining a high class of tenants for these apartments.

The entire scheme has been designed by Mr. R. Montgomery Rodden, architect, No. 8 Beaver Hall Square, and is being erected, under his superintendence, by Messrs. Lyall & Sons, Limited, contractors.

Automatic Water Sterilizer

For some long time, says "The Engineer," Dr. Nogier, of Lyons, has been experimenting with the mercury vapor lamp, finding that the ultra-violet rays emitted therefrom are very powerful in destroying any bacteria that may be present in limpid liquids, especially water. He has succeeded in removing the most virulent germs from drinking water without altering its chemical composition. One minute's exposure to the rays of the lamp suffices for the process of sterilization. He has now perfected an automatic water sterilizer, consisting of an aluminum tube containing a mercury vapor lamp, and controlled by an electro-magnetic tap, which at once stops the flow of water, should the lamp be put out of action. This method of sterilizing drinking water is claimed to be infinitely better—more certain, scientifically perfect, and cheaper—than the electro-ozone process.

The Greener Sun Company, of England, have opened a Montreal office at 63-65 Beaver Hall Hill, in charge of Mr. G. H. Oliver, who was formerly London manager for this company.

At a meeting of the City Council of Winnipeg, held last week, it was decided to advertise for competitive plans for a new city hall. The probable cost of the proposed structure is said to be in the neighborhood of $2,000,000.

Concrete as a Fireproof Building Material

Recent Developments Warrant Still More Extended Use of Concrete —Standard Building Methods will Effect Further Reductions in Cost*

By Frank B. Gilbreth, General Contractor, New York City.

It has long been realized that, with the wood supply of the world constantly diminishing, wood was bound to become too expensive to use as a building material. But it is not so widely realized that the day when wood is as costly as non-combustible building materials is here. To-day, concrete structures, and in some localities other non-combustible structures, can be erected at no greater first cost than wooden ones; with an added element of safety to those who use the building which cannot easily be overestimated.

In order to hold the place it claims—that of the cheapest and best fireproof construction material—concrete must be able to show itself cheapest in first cost, as well as cheapest in the long run.

Concrete materials are obtainable, everywhere: Stone ledges, gravel, sand, burnt ballast, slag, brick refuse, terra cotta chips, stone cutters' refuse and cinders, are all good aggregates for concrete.

Cost Reduced to Minimum

As far as the cost of the labor of putting the material in place is concerned, much has been done toward reducing that to a minimum. With metal forms and certified concrete, concrete construction is cheaper to-day than that with brick, hollow terra cotta tile or any other material.

The development of the entire concrete building and of the parts of the concrete building have been slow, because it has taken a long time to learn to think in concrete. Each student brought his stock of experiences from another field to bear on the problem, but the problem was so new that few could understand it in all its aspects. The engineer, who knew how to design the strength, knew little about artistic features. The architect, who alone could give beauty to the building, was not an expert in the methods that make low costs. Progress was made more difficult by the fact that so few of the structural features and construction methods were standardized.

The contractor, having analyzed his costs, saw that the forms were the largest single item in the cost of the concrete. This fact had its effect on the design of the concrete building, in the trend toward straightway repetition form work and flat-slab ceilings, with as little beam and girder work as possible. A further benefit was in the fewer corners for fire to attack or for interruption of the action of sprinklers, saving also in the cost of the sprinkler system.

After the flat-slab ribless type of ceiling, with its low cost of forms, came standardization of the units of forms for walls and columns. With the use of these metal form-units a new problem faced us, namely, slight modification of design to agree with the cheapest labor requirements of the metal forms. The influence was also felt, of the fire protection design thoroughly worked out and standardized by Charles L. Norton, professor of heat measurements at the Massachusetts Institute of Technology and engineer in charge of the engineering experimental station of the Factory Mutual Fire Insurance Companies. Mr. Norton's recommended practice, which is now universally accepted, is so simple and apparently so obvious that we sometimes forget to give him the credit for his work.

The importance of the forms, from the standpoint of economy, in being able to build fireproof buildings for the price of brick and wooden mill construction, is clearly shown by the fact that Charles D. Watson, of Syracuse, N.Y., on account of the reduction in the number and expense of forms, has been able to build a number of buildings from separately cast members and reduce the costs below anything ever cast in situ in wooden forms.

We come now to the latest developments, the metal form-units that have been perfected, densifiers for compacting the concrete, mechanical conveyors for displacing the wheelbarrow and hand tamping, and the concrete-producing factory, centrally located. These things have all arrived. Metal moulds have reduced the price of concrete to that of wooden construction.

Standard Methods of Construction

For the greatest saving in the cost per cubic foot of the completed building, the methods of construction, as well as the designs, must be standardized. This is rapidly being done. For example, the metal forms are set up and concrete is hauled in large quantities from a centrally located factory and poured at once for the entire storey of a building. This does away with the joints between the work of two different days, and permits of figuring the tensile strength of the concrete in design calculation, with a great consequent saving of reinforcement. Such calculations cannot be safely figured unless the whole storey is poured at once.

Figuring the cost of furring, lathing, plastering, interest, fixed charges, heating, and repairs, concrete is certainly cheaper than wood. If you also figure health, concrete is very much cheaper. A concrete building is cooler in summer and warmer in winter than any other kind. It can be cleaned out with a hose. It can be easily, quickly and thoroughly fumigated, room by room, or all at once. It is drier than any other, provided it is built with self-ventilating air spaces in all of the exterior walls. A concrete building is vermin-proof, and should germs or vermin get in the building, it may be easily rid of them.

Concrete as a Fire-Resister

It may seem that we have wandered from our subject of fires and their permanent elimination, but it was necessary to show that concrete is thus, from every standpoint, cheaper than wood, its only rival for low cost. Concrete construction is the best form for the elimination of fires, because it affords: (a) Least cause for fires; (b) least amount of damage to structural parts by fire; (c) least amount of damage to structural parts by water; (d) least amount of damage to contents of building by water; (e) least quantity of combustible structural materials in a room; (f) least speed of combustion of the contents of a room; (g) no concealed fires, all fires are in plain sight; (h) least spread of fire to adjoining parts of the same storey; (i) least spread of fire to storeys above; (j) least spread of fire to next buildings.

The causes of fires this paper will not discuss. The amount of damage done by a fire in a concrete building depends upon circumstances perfectly within our control and pre-determinable. With concrete made of properly selected fire-resisting materials, practically no damage is done, except by prolonged high temperature. The results of recent tests by Prof. Ira H. Woolson prove conclusively that a concrete building properly designed, with as few projecting corners as possible, will withstand long periods of the hottest hardwood fires with no resulting damage that cannot be thoroughly repaired with mortar and a plasterer's trowel. These tests were on full-sized rooms with walls of concrete made of different kinds of material.

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*Paper read before the American Society of Mechanical Engineers.

Concrete for walls can be poured in metal moulds with sufficient accuracy to permit of painting or wall-papering without further plastering or smoothing. This means that the best of this fire-resisting material is brought to the very surface of the wall where the flames strike. With metal moulds all corners can be made rounded as cheaply as square, or metal corner beads may, if desired, be inserted and retained in the moulds. Now, if a fire does occur in a building made of concrete cast in smooth metal forms, the damage is less than in any other type of building and the danger of spreading is less.

A concrete building can be damaged by water less than any other form of construction. To begin with, water does not injure concrete; in fact, it improves its quality. There is no wood to swell, and afterwards to shrink and crack the plastering. Even the paint best suited to be used on concrete lends itself particularly well to washing down with water. There are no hollow spaces that the water can flow through, damaging the contents below. A concrete building is water-tight from floor to ceiling, and small quantities of water can be easily handled through small scuppers, either into the air space of the vaulted wall, or through the wall to the outside. The fire is never hidden by the construction; consequently no unnecessary streams of water are flooded into the building.

What Proper Fireproof Construction Means

In a concrete structure there need be little or no combustible material. Let us take, for example, the dwelling house, for it is the most difficult to make both cheap and fireproof. In a concrete residence there is little trim that cannot be made better and cheaper of Portland cement than of wood. The chair rails and picture moulding can be made of concrete. The trim around the windows and doors can be moulded in metal moulds as cheaply as straight members. Even the wire mouldings can be done away with, and the conduits buried in the concrete partitions, walls, ceilings and floors. Baseboards should be made of concrete or else omitted entirely—as they serve no useful purpose in a concrete building, except in following wooden precedents. Windows may have cement sashes, with wired glass, and self-closing shutters, or self-dropping shutters of rolled-up metal or asbestos. Metal furniture may be used. The paint and varnish used on buildings and furniture should be selected carefully, as these are great factors in determining the temperature at which a fire will start and the speed with which it will spread. There is also a great difference in the paints and varnish used for painting concrete.

The flooring need not be of wood. There are many first-class non-combustible materials beside Portland cement that will fill every good requirement of wood and still be fireproof. There are also parquetry floorings, made of slow-burning wood, and much thinner than the old-fashioned hardwood floor, which makes the best flooring in case wooden floors are desired. In a concrete residence there is no excuse for wooden underflooring nor for wooden screeds.

The best form of construction for the elimination of fires is one that keeps the fire in plain sight, once it is started. One of the greatest obstacles in fighting fire in wood construction is the difficulty of locating a fire after it is known to exist. Every second of time lost gives it accelerated fury. Holes cut through the walls, floors and ceilings to locate a fire oftentimes only furnish more drafts to feed the flames.

With hollow concrete blocks, or monolithic cast-in-place walls and partitions there are no chances for the fire to be concealed. There is no cause for cutting into the partitions, floors or ceilings. There is no damage to the structure from cutting, no injury from water. With such a building, if a fire does start, it starts in plain sight, remains in plain sight at all times and can be attacked instantly before it has spread; and the water damage will be practically nothing. Fires in plain sight are usually extinguished before the arrival of the fire department.

From the Western Metropolis

Office of the "Contract Record."
Winnipeg, Man., June 17, 1910.

The building problem in this city has been considerably simplified by the advent of new brick and further receipts of shipments of outside supplies. Labor troubles are waning, and although the painters have not officially terminated their strike almost all the men are back at work.

It was the ambition of the city at the opening of the building year to lead the continent per capita, in building total for the season. Up to the past two weeks there was every prospect of attaining the object. Recently there has been a slight slump in the number of larger permits, but the office staff of the building inspector is now considering four big permits which will run the month's total close to the two million dollar mark. Unabated activity in the construction of residences has been the feature of the whole year to date, and with the assistance of these smaller items the city expects to pass the fifteen million dollar mark at the close of the year.

Permits have not yet been issued for the technical schools. These two buildings alone will cost in the neighborhood of $600,000. The biggest permit of the month, so far, was for the interior finishing of the union depot at a cost of $300,000.

Progress on the works now under way has been delayed by lack of material, shortage of labor and the absence of contractors, who have been so busy figuring on new work that they were unable to give proper attention to the contracts under way. With the slight let-up in the rush of large contracts the latter difficulty is being overcome, and the two former are almost entirely eliminated; so that work may be expected to go ahead with a rush now.

Regina is advertising locally for carpenters. There has been a strike in progress there for some time and labor is decidedly lacking. Winnipeg contractors with western contracts are shipping men out of the city to do the work, with the result that there are few idle hands here now.

C. P. R. in Western Canada

The Canadian Pacific Railway Company is preparing to continue the double tracking of the line between Portage and Brandon. J. C. Hargrave & Company, who recently completed subgrade work on the section of the line from Winnipeg to Portage, have been instructed to continue west and will proceed at once. This announcement was made last week by Mr. William Whyte, 2nd vice-president. The completion of this work will give the C.P.R. 522 miles of double track from Fort William west, and may be taken as one of the important steps in the solution of the railway problem of western Canada.

The entire reorganization of the western lines of the C.P.R. is now under way. The great increase in mileage of this portion of the system during the past ten years makes frequent changes necessary. This is the most radical of all. At the present time the western lines are operated as through grand divisions, and the plan now in hand is to reorganize them as four divisions. The total mileage of the C.P.R. is 9,800 miles, and of this 6,200 are included in the western lines operated from Winnipeg.

The new distribution will be practically according to the provinces, and the names of the divisions will probably be the Manitoba, Saskatchewan, Alberta and British Columbia divisions. Moose Jaw will be a divisional headquarters.

Vancouver and Coast Correspondence

Tremendous Activity in Building Trades—Contractors Hampered by Lack of Men—Current Prices of Building Material—Personal and News Notes

Vancouver Office of the "Contract Record."
Vancouver, B.C., June 15th, 1910.

The returns of building permits issued weekly by Building Inspector Jarrett go to show that the totals for last season are being swamped by the tremendous building movement that started early this year, and which has now attained astonishing proportions, the result being that contractors are being pushed as never before in the history of the city. An earnest effort is being made to supply the lack of homes complained of last year by newcomers, but so great is the rush of people from the Pacific coast States, Eastern Canada, the prairies, and many other points, that all new dwellings are sold or bespoken for rental before the plaster is dry—indeed, many are secured by deposit before the foundations are excavated. The prediction made in these columns in February last, that 2,000 new homes would be needed to provide for the people already here and to arrive, was very close to the mark. In proof of the scarcity of desirable homes even now—although hundreds have been rushed to completion already this season—the writer will cite several instances which came under his observation a week ago. A gentleman who had accepted a good position up-country, placed a "To Rent" card in the window at 1 p.m. By actual count 19 persons called to inspect the premises or make enquiries as to the rental price before the expiration of two hours! Another owner who was moving to his summer cottage up the North Arm, advertised his house to let in the evening paper. It was raining "cats and dogs," yet seven persons called in answer to the advertisement before bed-time. It is this sort of thing that is setting landlords by the ears and causing them to ask outrageous rentals for dwellings situated in the outskirts of the city.

The office men of the city are being well taken care of in the scheme of betterments planned by owners of business property "down town." Within the past twelve months, fully a dozen modern office buildings, with accommodation for perhaps 1,000 tenants, have been erected at central points, and the space in most of these has been all taken. Other tall fireproof office structures are under way, and by the time these are completed it is likely that the new agencies and businesses being constantly established will render these ventures a lucrative investment. The owners of premises vacated will suffer a serious loss in rentals for a time, and may be forced to fit up for other purposes, but these things adjust themselves very speedily in a go-ahead city like Vancouver.

Supply Firms Prepared for Busy Times

Warned by their experience of last year, when the unlooked for activity in house building exhausted various lines of supplies, thus causing a temporary stoppage of work and in some cases the use of substitute materials, the various contractors' supply firms laid in enormous stocks for this season, with the result that so far not the slightest hitch has been reported from this cause. Unfortunately, a supply of suitable men could not be arranged for beforehand, and contractors have suffered from a lack of laborers. Incompetent men constantly aspire to jobs concerning the duties of which they are entirely ignorant, and it is not unusual for a contractor in charge of the erection of a large building to "try out" 500 men during construction.

Vancouver is essentially a city of modern homes owing to the mildness of the climate, hence the unprecedented scope of the building operations under way presupposes the filling of huge orders for lumber, shingles, sash, doors and all classes of interior finish. Still, lest our readers may run away with the impression that the more substantial materials are little used, we deem it well to point out that 50,000 tons of steel will likely be put into office buildings and warehouses, in addition to immense quantities of cement and considerable stone, while about 20,000,000 bricks will be built into new stores and chimneys.

Prices of Building Materials

(Delivered on job.)

Building paper, tarred, per roll, 90 cents.
Building paper, plain, per roll, 70 cents.
Bricks, common, per 1,000, $13.50.
Bricks, pressed, per 1,000, $40 to $62.
Cement (Vancouver), per barrel, $3.10.
Roofing felt, per 100 pounds, $2.45.
Fire brick (Scotch), per 1,000, $45.
Fire brick, small quantities, $48.
Lime, per barrel, $1.35.
Sewer pipe, per foot, 4-inch, 18c.; 6-inch, 33c.
Plaster of paris, per ton, $18.50.
Putty, per pound, 5 cents.
Tar, 4-gallon tin, $1.25; per barrel, $8.50.
Hard wall plaster, per ton, $17.50.
Nails, base, $3.25.
Nails, cut, $4.25.
Mixed paint, gallon, $2; ½-gallon, $1.10; quart, 60c.
Boiled linseed oil, gal., $1.40; barrel lots, per gal., $1.20.
White lead (genuine), 100 pounds, $8.50.
White lead, No. 1, per 100 pounds, $8.
Varnishes, furniture, 80c., $1; hard oil, $1.75; elastico-oak, $2; elastico-floor, $3.25.
Sash cord, per pound, 50 cents.
Sash weights, per 100 pounds, $3.
Tacoma hair fibre, per ton, $18.
Fire clay, per ton, $20.
Plate glass (35 per cent. off local tariff).
Sheet glass (10 per cent. off local tariff).
Expanded metal lath (Hays') 27 cents per square yard; Herringbone lath, 17 cents per square yard.
Ready roofing (Sendor brand), ½ ply, $2.25; 1 ply, $2.65; 2 ply, $3.40; Malthoid, 1 ply, $2.75; 2 ply, $3.25; 3 ply, $3.70.
Hexagon floor tiling, average 55 cents per square foot.
Wall tiling, average 60 cents per square foot.
Turpentine, per case, $10.
Resin, per pound, 5 cents.
Elephant lead, per 100 pounds, $8.50.

PIG IRON, ETC.—

Pig- iron, Eglinton, No. 12, $21.75 per 2,240 pounds, ex-wharf Vancouver.
Pig lead, $90 per 2,240 pounds, ex-wharf Vancouver.
Tin plate, I.C., 14 x 20, per box, $3.50, ex-wharf; Canada plates, local, $2.90; polished, $3.10.
Steel rails, 15-pound, $50 per 2,240; 30-pound, $45 per 2,240, ex-wharf Vancouver; 50-pound, $45 per 2,240 pounds.

Notes

At a recent meeting the Vancouver City Council approved a recommendation of the Board of Works that a new garbage incinerator be provided, the capacity of the present one being insufficient for the needs of the rapidly growing community. The tender of a Portland company for a plant to cost $71,491 was accepted, the amount being divided up as follows: $61,121 far the plant proper, $6,370 for a clinker car system, and $4,000 for foundations.

The steel skeleton of the Holden office building on Hastings street will be completed in a few days. The structure will consist of ten storeys and basement, and will be fireproof, the floors being of reinforced concrete. Messrs. J. Coughlin & Sons have the contract for the stone, brickwork and steel frame.

Messrs. Honeyman & Curtis, local architects, have completed plans for the Bank of Montreal branch on the northeast corner of Westminster avenue and Cordova street. The frontage will be 57 feet on the avenue and 68 feet 6 inches on Cordova. The structure will be built of Indiana limestone with local granite foundations and ferro-concrete floors and supports.

Hemphill Bros., well known dealers in contractors' supplies, recently incorporated as a limited company with a capital of $25,000.

The steel frame of the new 10-storey Metropolitan Building on Hastings street, opposite the handsome Winch Building, is now well advanced. It is being built by the Wells Construction Company, and will be larger than the Dominion Trust Building, though not as high. The cost is estimated at $300,000. Messrs. John S. Helyer & Son are the architects.

The council of Point Grey, the ambitious municipality to the south of Vancouver, has let contracts for over $800,000 worth of roadway work, including clearing and grading, and will soon have a network of first class thoroughfares.

The National Paper Mills Company, which is erecting a plant near Fraser Mills, B.C., about three miles from New Westminster, has two mayors on its provisional directorate—Mayor J. A. Lee, of New Westminster, and Mayor L. D. Taylor, of Vancouver.

Fifty-six salmon canneries will be operated on the British Columbia coast this season. Nearly one-half of the plants will be on the Fraser river, most of the balance being located on the Skeena river, at Rivers Inlet and the Naas.

The paving of Columbia street, New Westminster's business thoroughfare, is now in progress, and already the property owners on other streets are taking the necessary steps to secure similar improvements. Specifications for about five miles of paved streets and two miles of cement walks are being prepared by the city engineer, both works to be carried out under the local improvement by-law. The work on streets, sewers and waterworks extensions contemplated and under way will call for a total expenditure of about $800,000.

John W. Considine, of Seattle, the well known director of vaudeville circuits, who recently purchased the Vancouver Opera House on Granville street, proposes to erect on the lots occupied by that building a mammoth ten-storey office building. What will be unique in the proposed structure, as far as western building operations are concerned, is that the new block will be erected over and around the opera house. The proposed novel plan is necessitated by the fact that Mr. E. R. Ricketts, the present lessee of the opera house, has contracts which cannot be cancelled for two years.

A strong syndicate of Montreal capitalists has been formed to develop pulp and power industries in the vicinity of Prince Rupert. The enterprise will be known as the Pacific Pulp & Power Company, and it is proposed to generate 15,000 h.p. at Union Creek, about 16 miles from Port Simpson and 30 miles from Prince Rupert, the Pacific terminus of the Grand Trunk Pacific Railway, and which is now reported to have a population of 5,000 people. Four lakes can be tapped for power development purposes, while at the site for the dam there is a townsite of 114 acres available. The timber area controlled by the syndicate is said to comprise about 15,000 acres in two blocks, both being heavily timbered with spruce, cedar and cottonwood. A Montreal power expert is now on the ground preparing a report, while three timber experts from British Columbia and New Brunswick are cruising the stands. The syndicate have in view the supplying of electric light to Prince Rupert and Port Simpson, and the construction of an electric railway between the two places. The sphere of operations may extend over a radius of 75 miles around the city of Prince Rupert.

Vancouver's Continuous Growth

The official statistics for May surprised even the most optimistic believers in Vancouver's future. Most noticeable are the increases in Customs, building receipts and land registry.

Customs—The returns for the month shatter all records, the revenue being $470,000, or about $9,000 more than April, which was the previous record, and an increase of $195,681 over May, 1909.

Building—The value of the permits issued during May was $940,000, or almost double the record for May, 1909. The permits for the first five months of 1910 reached a total of $5,720,000, as against $2,836,165 for the corresponding period of 1909, or more than double.

Bank Clearings—The returns for May for the past three years make instructive reading, the increases being phenomenal. They are: May, 1910, $36,460,680; May, 1909, $20,715,136; May, 1908, $13,956,396.

Land Registry—Receipts in this department for May, 1910, were $18,617.30, as against $11,066.80 for May, 1909. For April of the present year—always a big month—the returns were $21,454.60.

The Canadian Pacific Railway Company has purchased the Railway Block property adjoining on the west the uptown office block of the company on Hastings street, giving a combined frontage of over 75 feet. The front of the blocks will be remodelled and made uniform, and an addition may be built to the rear. For some time past the accommodation of the telegraph office and uptown ticket office of the C.P.R. has been woefully inadequate, and the acquisition of the adjoining block becomes a necessity.

The corporate limits of Seattle embrace an area of 109 square miles; the city of Portland an area of 51 square miles; Vancouver, excluding Stanley Park, slightly under nine square miles. The building permits in Portland's 51 square miles for the first four months of this year were approximately five millions of dollars. The permits within Vancouver's comparatively insignificant area of nine square miles for the same period, amounted to about a quarter of a million more than those in nearly six times the area at Portland. Had we the building statistics for 20 to 30 square miles of Vancouver instead of only nine square miles, the showing would have advertised to the world the superlative vigor of Vancouver.

Booms of logs are coming to the sawmills of Vancouver by almost every tide. Enamelled baths come in by freight trains from Ontario. High class plumbing brassware approaches us from the American side. Cement comes in by the shipload from England and other places. Bricks are being unloaded from scows daily—some of them from ocean-going ships. Nails converge here by the ton. All this means that building is going on in Vancouver at a faster rate than has ever been. If you put your ear to the ground you can almost hear the houses and office buildings going up. The speed with which the aforementioned materials are made into houses is astonishing.

Local improvement works on a large scale are in progress in Victoria, some 40 different works being under way. The city engineer requires 1,500 men in order to carry out the programme passed by the city council. Following the example of the mountain millmen, who are in need of 1,500 additional employees to make their working gangs complete, the engineer is advertising in the eastern papers for laborers.

Mr. Herbert E. Law, vice-president of the Western Steel Corporation, Limited, visited Vancouver early in June. In conversation with leading members of the Board of Trade, Mr. Law said the site of the company's proposed British Columbia plant would be announced shortly. The company has a capitalization of $20,000,000, and assets valued conservatively at $43,000,000, including valuable iron, coal and timber properties in British Columbia. The plant to be erected will be in operation within two years; its initial capacity will be 350 tons of pig iron daily, to be increased as market conditions warrant.

Mr. Bogart, of the Pacific Coast Pipe Company, returned recently from a trip through the Okanagan and Vernon districts, where several water systems have been constructed of the company's wood pipe. Mrs. Bogart accompanied her husband.

Upwards of 1,200 men are on the city pay rolls at the present time, being employed on street improvements and sewer construction work. About $3,000 per day is being paid out to them by the city treasurer.

The British Columbia Government has announced its intention to establish a provincial park in the vicinity of Buttles Lake, Vancouver Island. The decision is hailed with much satisfaction by Victorians and the officials of the Vancouver Island Development League, as it is felt that the preservation of such a magnificent scenic area will enhance the value of the island as a tourist resort, besides conserving a considerable tract of fine timber.

C. T Cartwright, who on June 1st resigned his position as engineer of the Pacific division of the C.P.R. in order to practise his profession in a private capacity in Vancouver, was presented with a handsome set of office furniture by the engineering staff of the railway, including Vancouver, Victoria, Revelstoke and Nelson divisions. J. C. Rundle, assistant engineer of the central division, with headquarters at Winnipeg, has been appointed to the vacancy created by Mr. Cartwright's resignation.

A convincing proof of the steady growth of Victoria, the provincial capital, is exemplified in the increase in the value of realty as shown by the figures of the completed assessment roll, which are $9,586,120 in excess of those of a year ago. The totals are as follows: Land, $26,295,330; improvements, $11,619,980; total, $37,915,310. Last year's figures were: Land, $17,960,980; improvements, $10,368,210; total, $28,329,190.

The Blue Funnel liner Keemun recently delivered at Victoria 2,000 tons of big steel pipes for the Esquimalt waterworks. The pipes weigh 2½ tons each.

Mr. Alexander Robinson, C.E., representing the Robertson-McAlpine iron works of London and Glasgow, who is touring Canada with a view to establishing a central branch of the firm, spent a few days in Vancouver recently. Either Montreal, Toronto, Ottawa, Winnipeg, Vancouver or Prince Rupert will secure a prize in the shape of an industry which will employ some 500 men. Vancouver's chances are considered good.

Mr. H. M. Burwell, C.E., of Vancouver, has been engaged by the city council of Victoria, B.C., to survey and report upon the Sooke Lake water scheme and the possibility of diverting Leech river so as to give it an inlet into the lake, also the cost of a tunnel to convey the water to the city for consumption purposes. The present capacity of Sooke Lake is estimated at 23,000,000 gallons daily; by diverting the Leech river it is hoped to increase the supply to over 125,000,000 gallons daily, which would allow of extensive power developments. The present capacity of Sooke Lake is ample for a population of 250,000 people.

Canadian City Engineers

James Gray Lindsay, Belleville, Ont.

In many parts of the globe—and Canada is no exception—Irish birth is a strong recommendation to popularity. Canadian city engineers are recruited from several nationalities, and it would be strange indeed if Ireland had no representation among them.

James Gray Lindsay, city engineer of Belleville, Ont., was born in Belfast, Ireland, in 1870. He adopted the profession of a civil engineer and throughout his career has demonstrated marked ability in that calling. His early training was received from Mr. J. J. McDonnell, C.E., J.P., of Belfast, Ireland. After serving his articles, Mr. Lindsay held several appointments previous to commencing practise in the year 1895.

The city engineer of Belleville has had a great deal of experience in various parts of the world. He held an engagement with the contractors on the Belfast Main Drainage Scheme, a project involving an expenditure of £300,000, that is over 2½ million dollars.

He has acted for the British Government in the West Indies, and was afterwards offered the position of Colonial Engineer on the Gold Coast of West Africa, which, however, he declined owing to climate; then as city engineer of Guelph in addition to his present work. It is of interest to note that Mr. Lindsay is a member of the Ulster Society of Architects, an association which is in alliance with the Royal Institute of Architects of Great Britain. In his architectural capacity, Mr. Lindsay has prepared and executed plans for varied and extensive building schemes. As city architect of Belleville, as well as city engineer, he has carried out various alterations to the City Hall buildings and the Isolation Hospital. Mr. Lindsay has also been prominently identified with the engineering work and general superintendence entailed in various railway and other projects. The expert knowledge which Mr. Lindsay has acquired as a result of his wide experience eminently fits him for municipal engineering in this country. City Engineer Lindsay knows his work and he has the confidence and initiative to apply his knowledge to the best advantage.

City Engineer Lindsay, Belleville, Ont.

Mr. Allan MacDougall left Ottawa last week to take up his duties as assistant engineer on the Quebec bridge.

An Industrial Acquisition for Toronto

The accompanying view shows a portion of the structures to be erected for the new paint factory of Messrs. Pinchin, Johnson Company, Limited, Toronto. The building has a frontage on Carlaw avenue of 100 feet and a depth of 50 feet. It will be equipped with the most modern machinery and will afford every facility for the manufacturing purposes for which it is to be used. Readers of the "Contract Record" will be interesting in knowing that the above named company is the Canadian branch of Messrs. Pinchin, Johnson & Company, Limited, of London, Eng. The firm has been established since 1834 and enjoys an excellent reputation throughout the British Empire and Continental Europe. The same brands that have made the parent company famous will be manufactured in Toronto. Of these may be mentioned Minerva paint and Satinette white enamel.

A Portion of Messrs Pinchin, Johnson Company's new Paint Factory.

The officers of the Canadian company are as follows: Jas. E. Ebersole, Toronto, president and treasurer; Oscar Rosenberg, Chicago, Ill., vice-president; Gordon C. Scott, Toronto, secretary; P. P. O'Neill, superintendent of the paint plant.

Notes

Mr. Jos. Bourque, the well known Hull, Que., contractor, was married last week to Miss Fortier, daughter of the town clerk of Pembroke.

Mr. E. L. Cousins, resident engineer for the G.T.R., has been appointed assistant to City Engineer Rust, of Toronto, at a salary of $200 per month.

We regret to report the death of Mr. Thos. Crowley, manager of the Great West Pipe Covering Company, Winnipeg, which occurred at Toronto last week.

In the case of Halley v. the Phoenix Bridge Company, an action for damages for injuries sustained in the collapse of the Quebec bridge, the plaintiff has been awarded the sum of $20,000.

After lasting six weeks, the strike in the building trades at Regina, Sask., ended last week with the acceptance of the schedule drawn up by the Builders' Exchange. The men relinquished their claim for closed shop.

The death occurred recently, at Toronto, of Mr. Chas. E. Goad, a well known civil engineer and a member of the Canadian and American Societies of Civil Engineers. Mr. Goad's specialties were the preparation of maps for municipalities and fire insurance plans.

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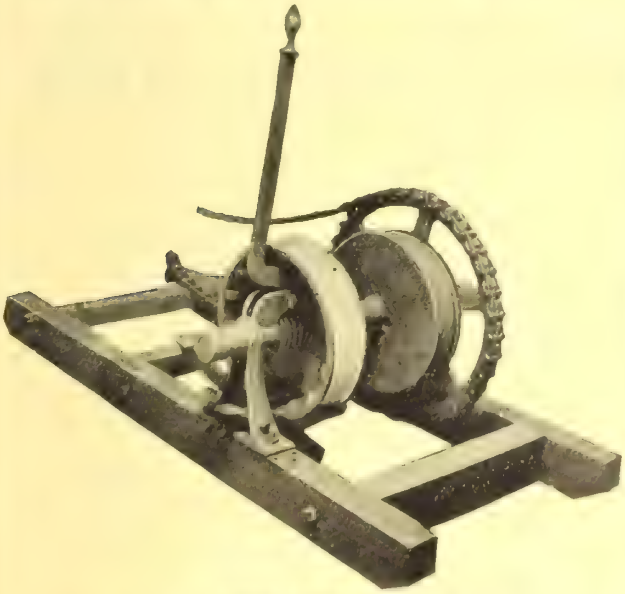

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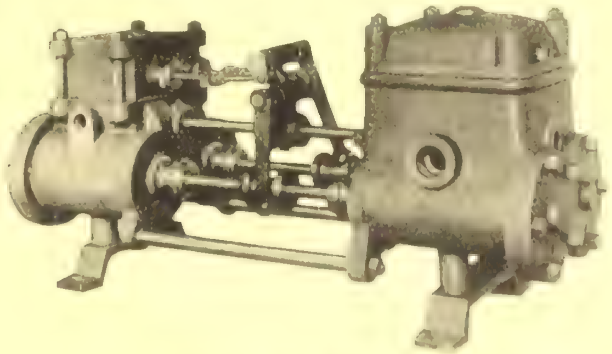

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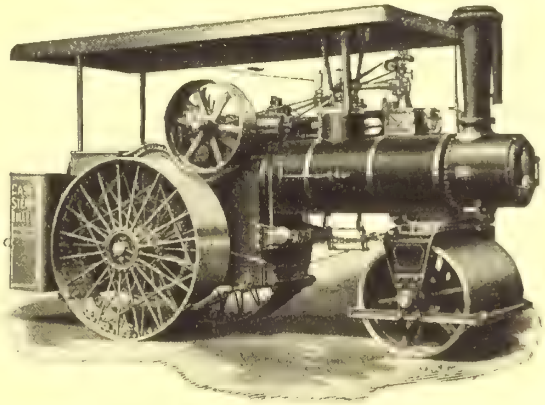

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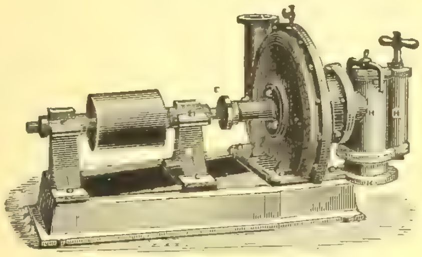

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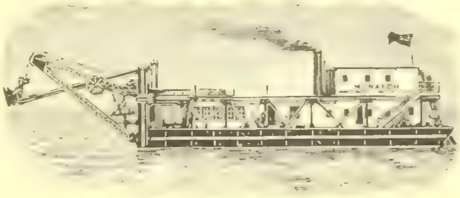

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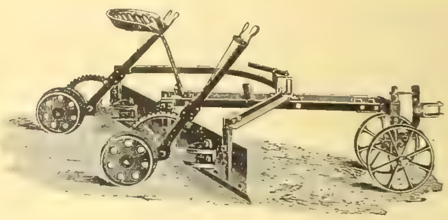

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Red Deer, Alta.
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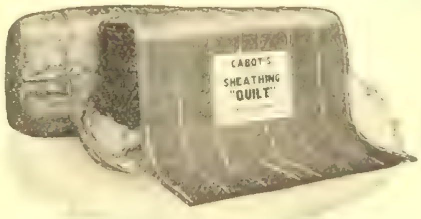

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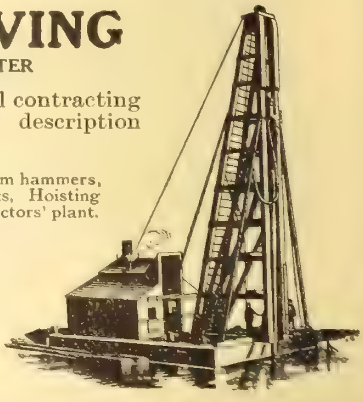

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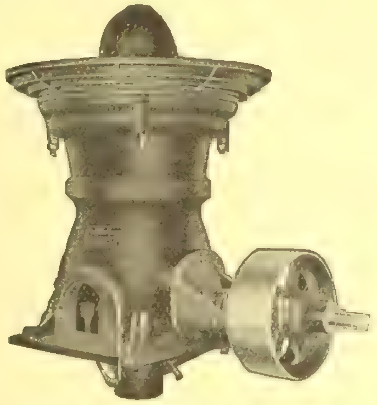

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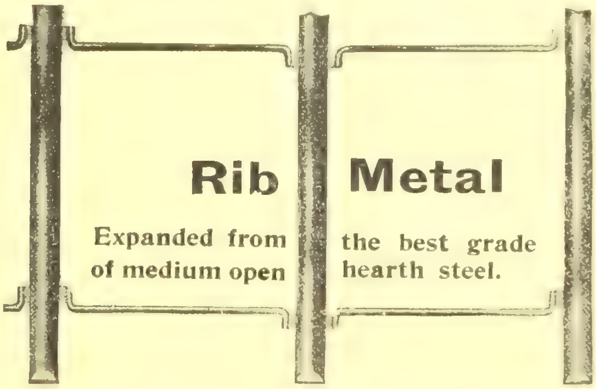

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BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks	$18.00
No. 1 dry pressed buff bricks	18.00
Red stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work . . $10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from $80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6,25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	7,25	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i,	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14,00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	.,..	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex, and 3-16 inch round, 58 cents per square foot up.

Floor Tile—½-inch square 65 cents.

Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, firsts 70 cents.

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Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

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Standard compression work, 65 and 5 per cent.

High grade compression work, 60 per cent.

Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.

Boilers—Galvanized Iron Range,

30-gallon, standard, $4,50; extra heavy, $7.00.

CastIron Sinks.

16 x 24, $1 00; 18 x 30 $1.15; 18 x 36, $1 95

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2,03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

7 and 8-inch pipe, 40 per cent.

Light pipe 60 and 10 per cent.; fittings, 70 and 10 per cent.

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Cement wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.

Cement, car lots, f.o.b, Toronto, bags extra, $1.75.

Crushed stone, $1.25 per ton, f.o.b. Toronto,

Binder stone, $1.25 per ton, f.o.b. Toronto.

Burnt River rubble, stone delivered, $14 to $15 per toise.

Free stone delivered, $14 to $15 per toise.

Brown coursing stone, delivered, $3.25 to $3,50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 35 cents per foot.

Rubble stone in car lots, $1.25 to $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per thousand.

Steel channels and beams, $2.75 per 100 pounds, delivered, f.o.b. Toronto.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

Lime, per cwt., delivered, 38 cents,

Plaster Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Hard Wall Plaster, unsanded, $10.50; sanded $5.50;; universal finish, $15.50.

PAINTS AND OILS.

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Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.

Pure XX Zinc White, ground in oil, $7.50 to $8.00 to $9.00 per 100 lbs.

Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs,

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Turpentine, in barrels, 85 cents per gallon.

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Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

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The Western Canada Electric Company, Montreal, capital $1,500,000. Incorporators, Messrs. G. V. Cousins, accountant; P. F. Brown, W. R. Ford, all of Montreal.

McAuliffe, Davis Lumber Co., Ottawa, incorporated, capital, $200,000. Incorporators, W. H. McAuliffe, A. G. Gill, A. M. Davis, R. W. [illegible], and M. F. Davis, lumber merchants, all of Ottawa.

The National Brass Manufacturing Compnay, capital $50,000, will carry on business in Montreal as makers and dealers in metal castings, etc. Messrs. R. T. Heneker, K.C., and Duff and Johnson, advocates, Montreal, Que., incorporators.

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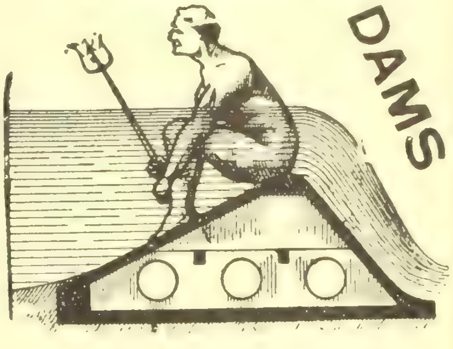

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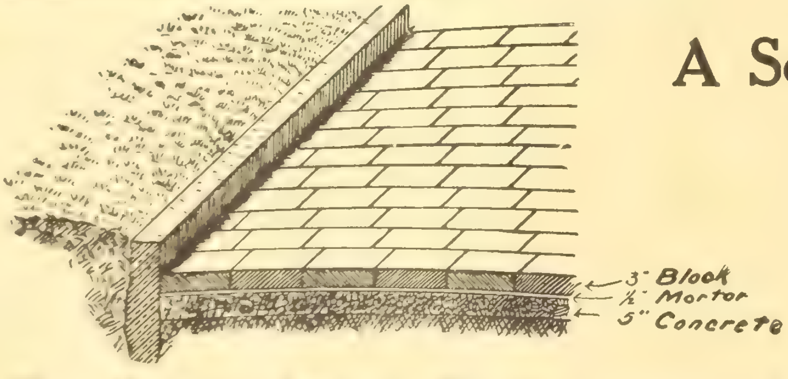

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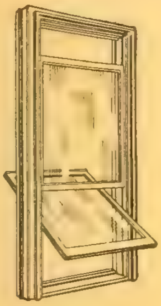

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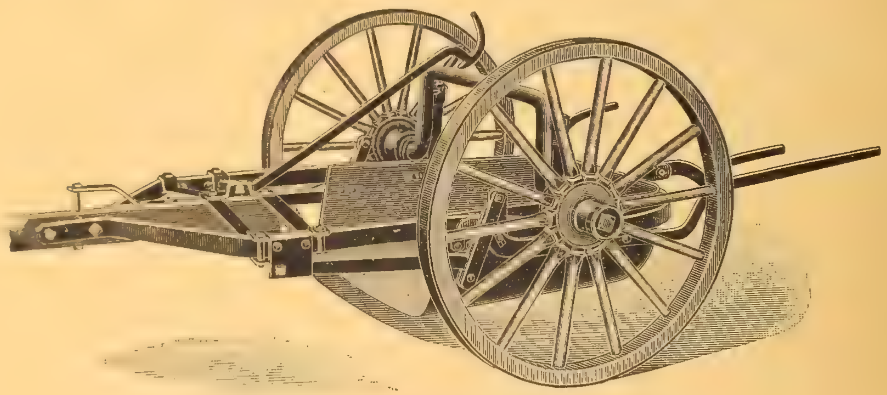

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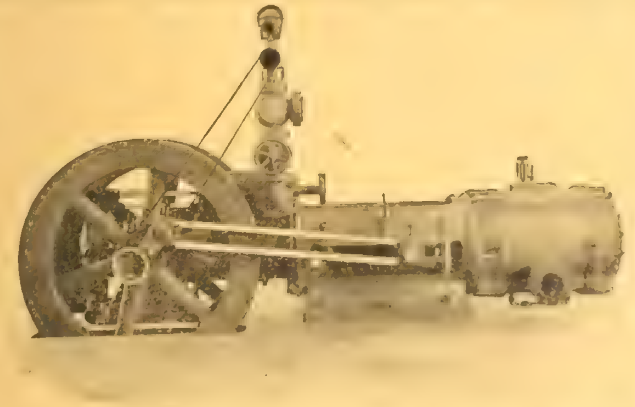

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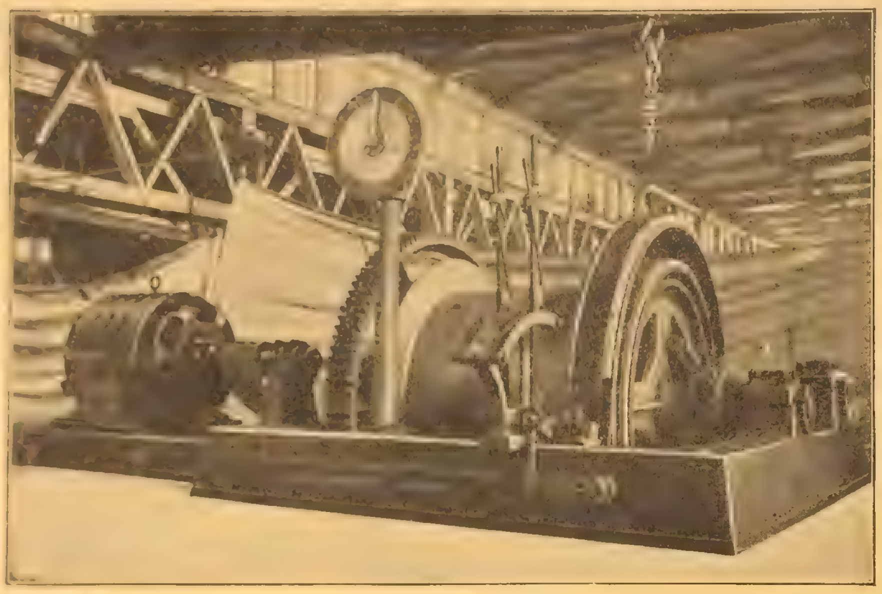

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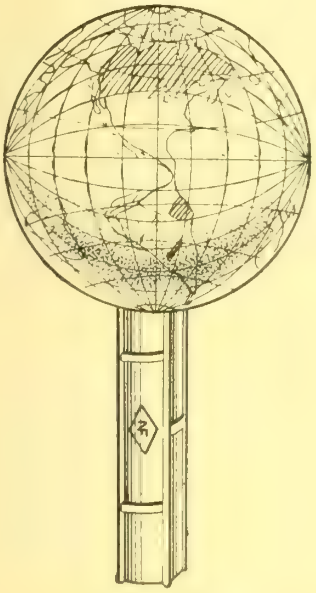

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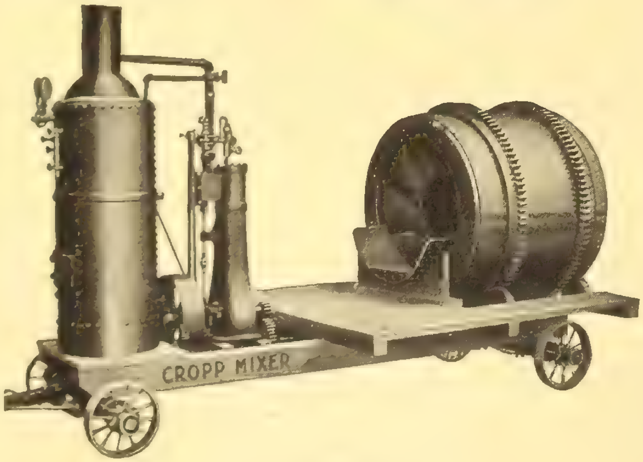
Cropp Mixer



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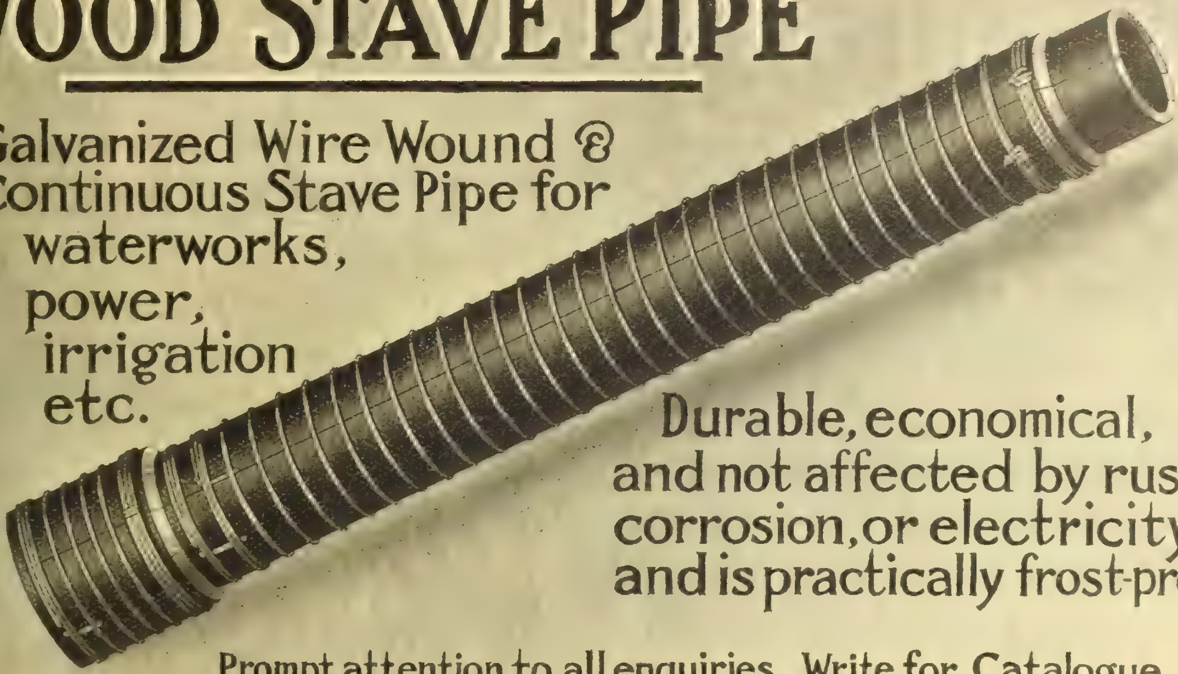

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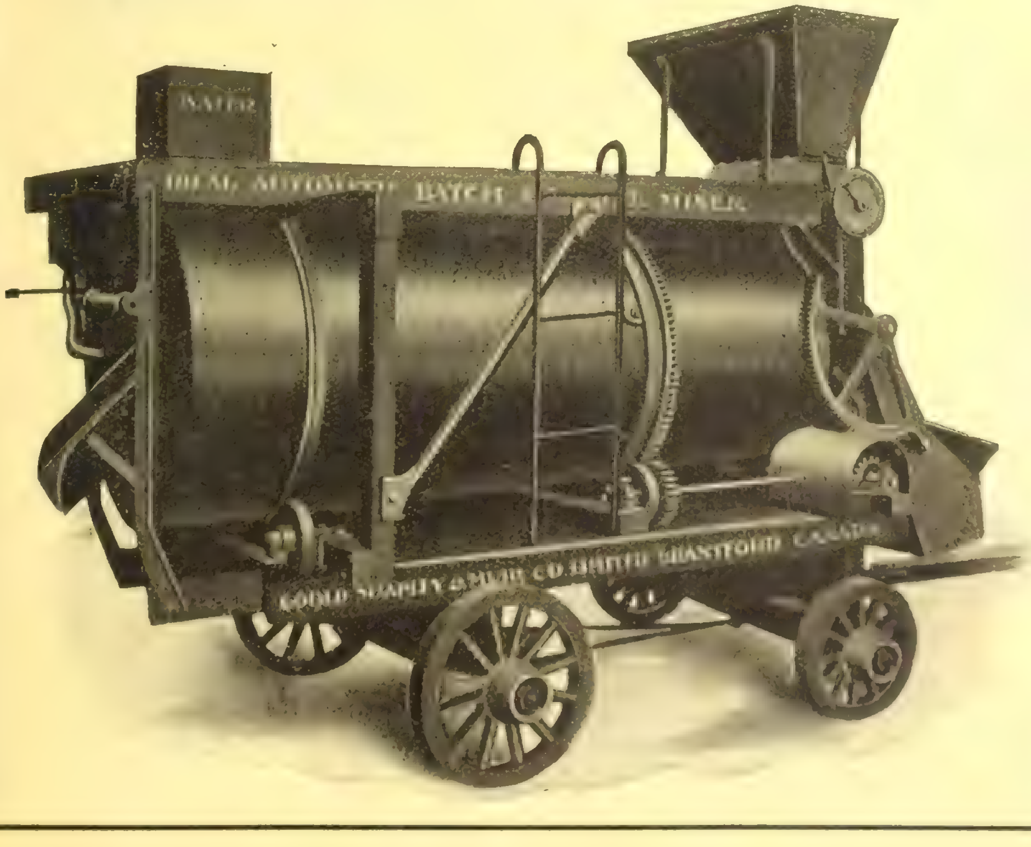
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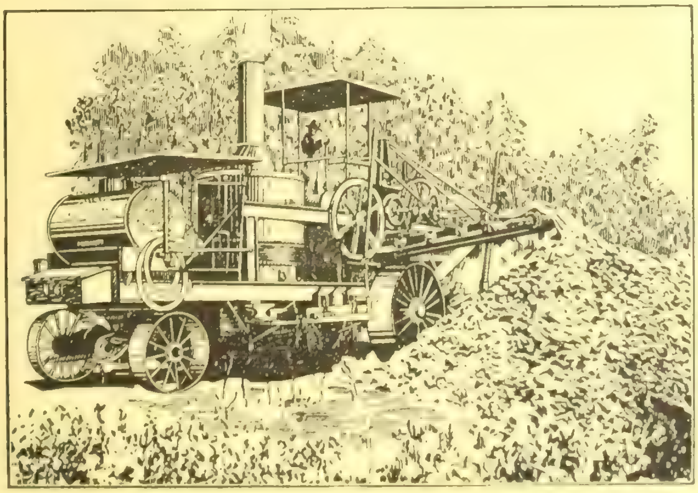

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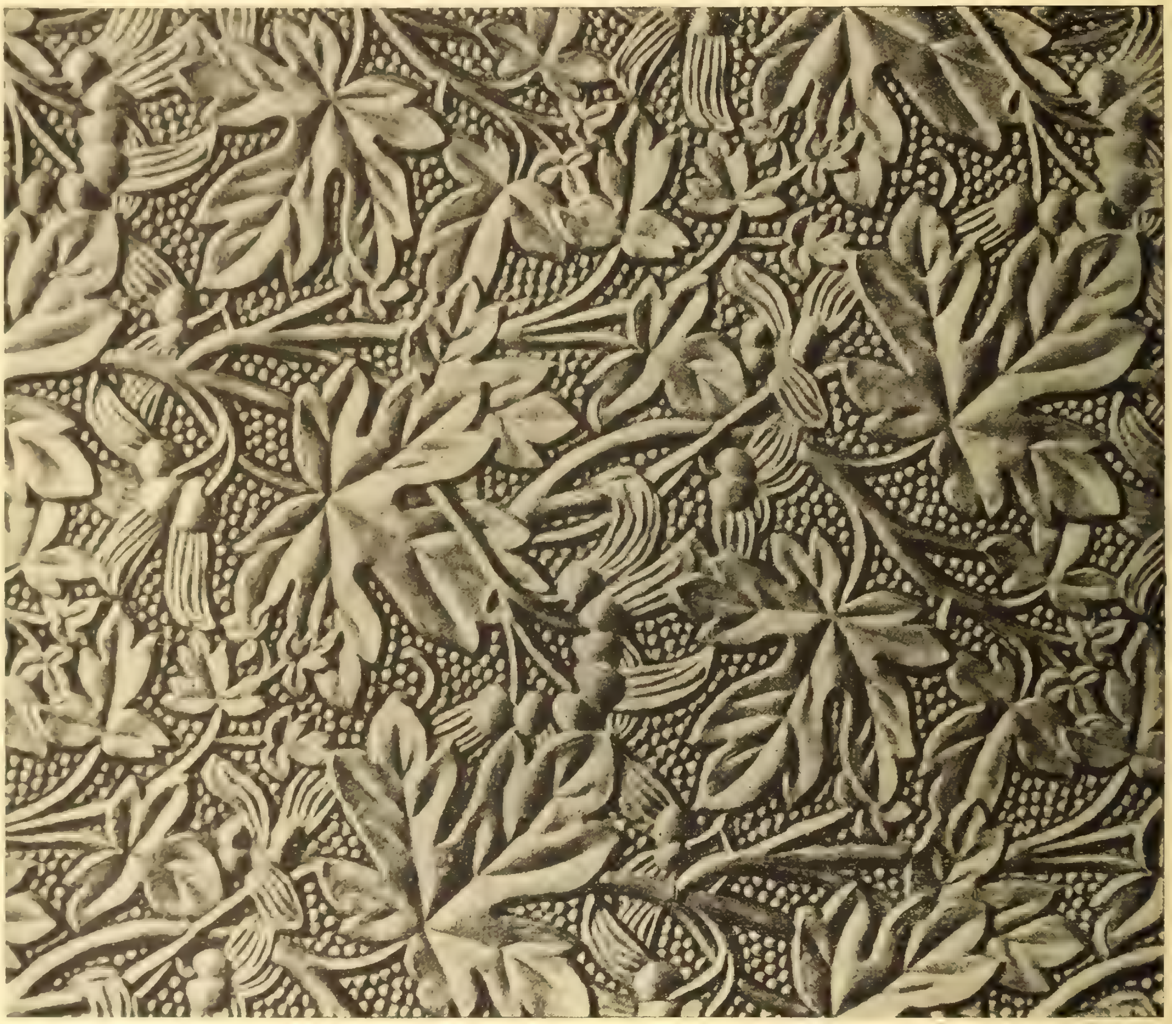

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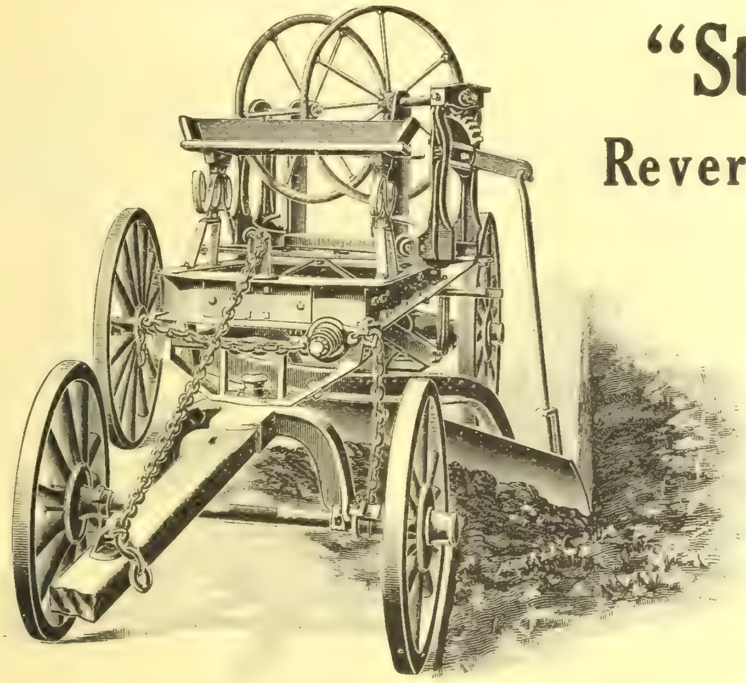

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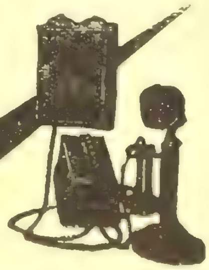

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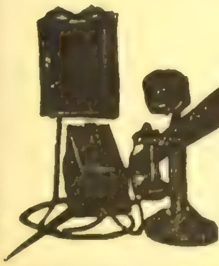

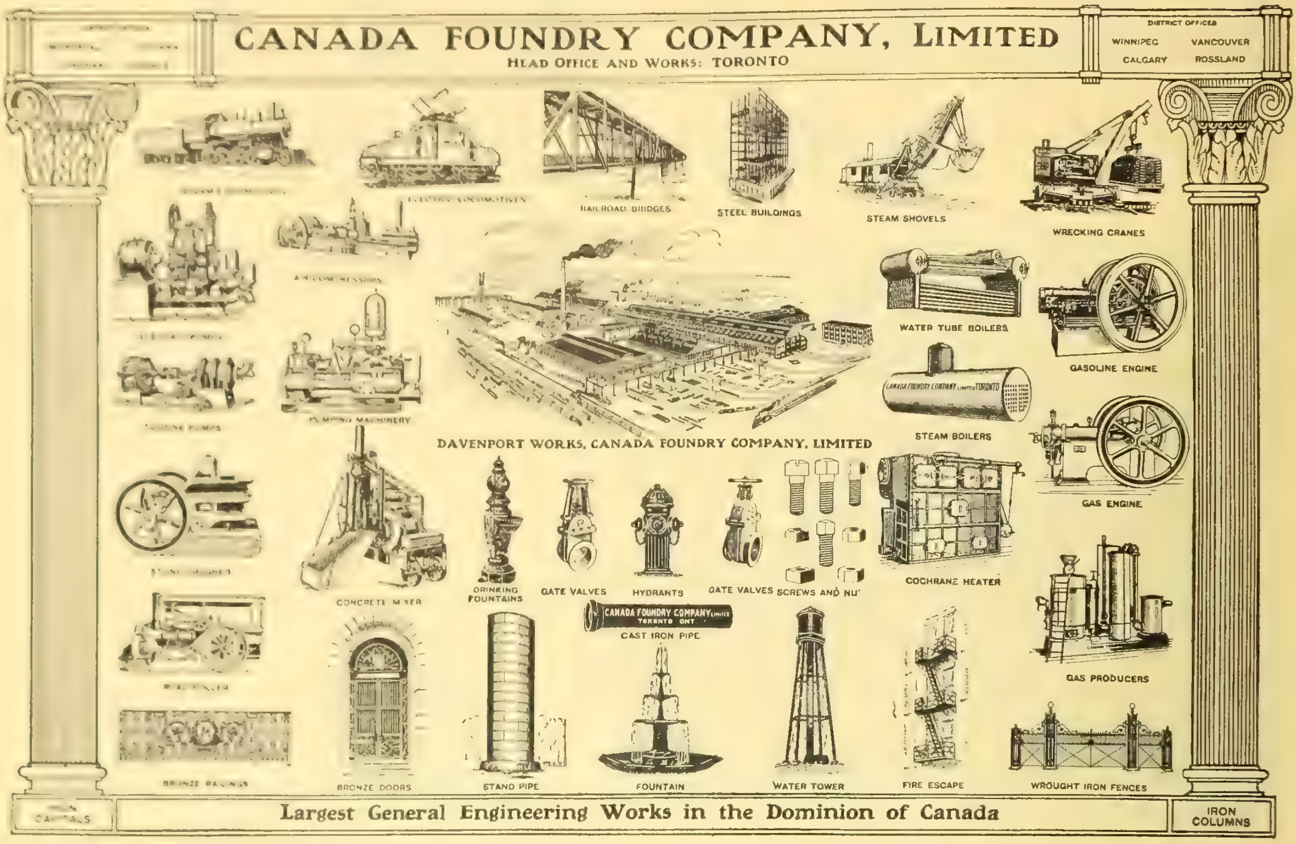

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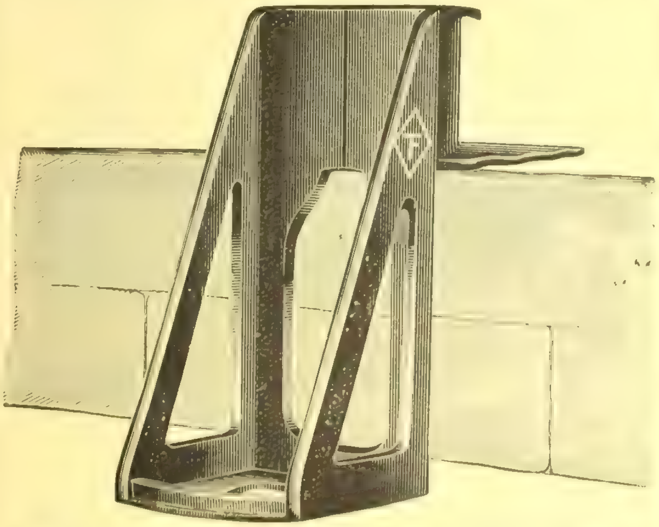

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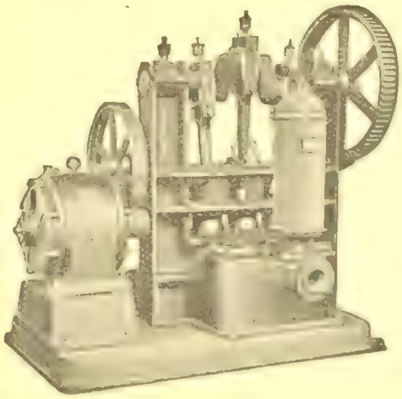

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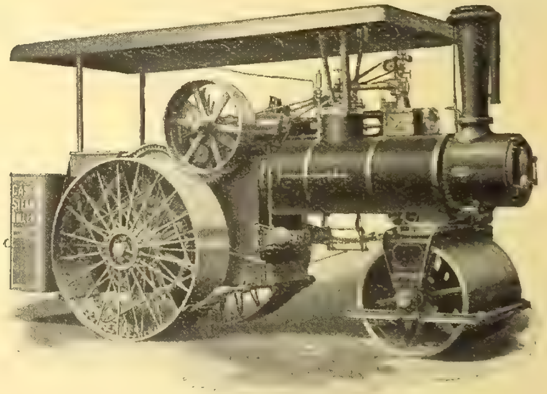

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(Trade Mark Registered)

is the best

BECAUSE

It is made by the best process.
It is made from the best material.
It is made by the best workmen.
It is made in the best factory.
It is made promptly.

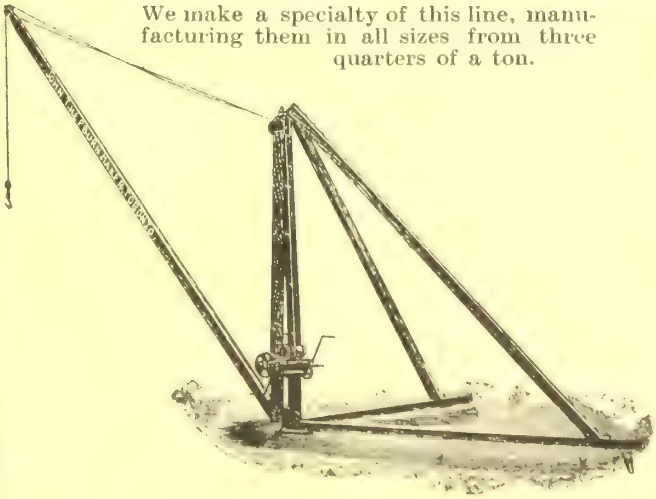
Don't forget these points when letting your contracts.

The Roman Stone Co.
Limited
100 Marlborough Ave.,
Toronto.

T. A. MORRISON & CO.,
204 St. James St.,
MONTREAL.

Scotch Derricks

We make a specialty of this line, manufacturing them in all sizes from three quarters of a ton.



Our derricks have single and double purchase gears, band brake and as much heaving rope as will reach the ground.

Write us for particulars about the "Little Wonder Cement Block Machine" and the **"New State" Concrete Mixer.**

Demorest Concrete Construction Moulds

Prices on application

JOHN T. HEPBURN
18-34 Van Horne St., Toronto, Canada

High
Grade
Fire
Brick

For
Cupola Linings
Blast Furnaces
Boiler Settings,
etc.

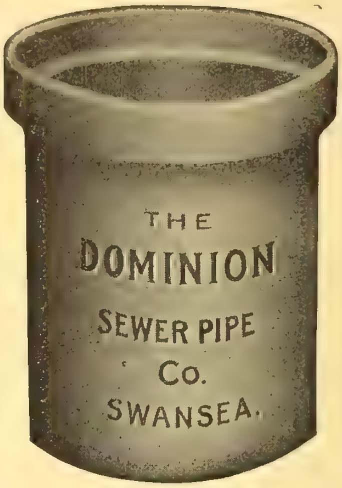
Cupola Block and Standard 9 in. shapes Carried in stock.

Ask for Catalog.

The Toronto Pottery Co., Limited
TORONTO, CANADA

Canadian Branch of the Robinson Clay Product Co., Akron, O.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

Telephone (Toronto Connection)
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The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Sewer and
Culvert **Pipes**

Salt glazed, and perfectly vitrified. 4 to 24 inch "Standard" and double strength pipes always in stock.

Also Inverts, Wall Coping, Building Blocks, Chimney Tops, Fire Clay, Chimney Linings, round, square and oblong.

Stove and Range Bricks and all Kinds of Fire Clay Goods.

The
Standard Drain Pipe Co.
Factories:
St. Johns, P.Q., and New Glasgow, N.S.

American Sewer Pipe Co.
Akron, Ohio, U.S.A.

Largest Manufacturers of
Glazed Earthenware
in the world.

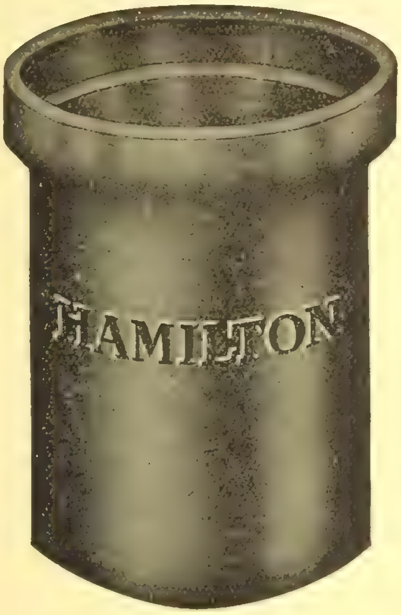
Sewer Pipe
Single and Double. Strength, 3″ to 36″

Clay Conduits Single and Multiple

Samples furnished on request.

WE INVITE COMPARISON

A FEW REASONS **Y** YOU SHOULD BUY



Hamilton

Vitrified Salt Glazed Sewer Pipe for all Sewers, Drains and Culvert Purposes

QUALIT**Y**	No recognized **equal**
DELIVER**Y**	Unsurpassed by **any** other Manufacturer
QUANTIT**Y**	Largest Stock in **Canada**
ECONOM**Y**	First cost is the **only** cost
DURABILIT**Y**	Measured only by **time**
RELIABILIT**Y**	Our **Fifty successful years**
PRACTICABILIT**Y**	The **Natural Product** for **Sewers**

If **U R Y'S U** will write us **immediately** and in future SPECIF**Y** **Hamilton Pipe**

The Hamilton and Toronto Sewer Pipe Company, Limited

Long Distance Phones:
Hamilton, 3990--3991
Toronto, Main 990, College 1558

Head Office:
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"MEDUSA"

Water-proof Compound

Makes concrete impervious to water
Prevents discoloration and Efflorescence

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"Medusa" gives absolutely permanent results, will not affect strength, setting or color of Portland Cement

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Write for prices and descriptive printed matter which gives full instructions for using.

Manufactured in Canada by

Stinson-Reeb Builders' Supply Co.
Limited
9th Floor Eastern Townships Bank Bldg., MONTREAL, P.Q.

We want Agents in every city and town to handle this material

We Manufacture the Highest Grade

Hardwood Flooring

That Can Be Produced Anywhere

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

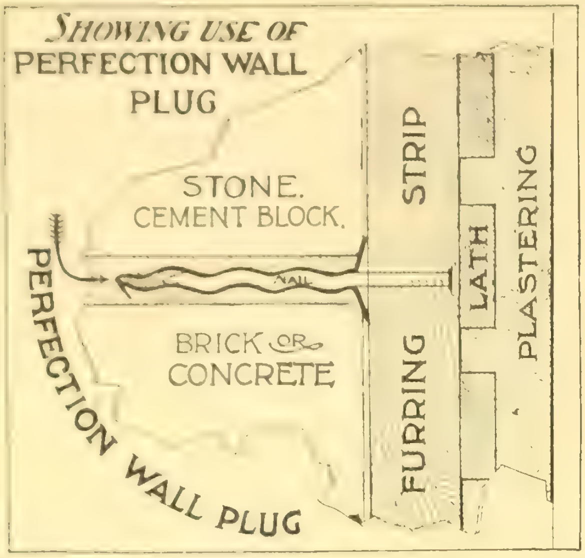
We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongued and grooved, hollow backed, bored and bundled.

We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to

Siemon Bros., Limited
Wiarton, Ont., Canada
309-10-11 Confederation Life Building, TORONTO



The coming attachment for furring to brick walls

Costs almost the same as a wood lath laid in the mortar joint. Infinitely better. Wood plugs (the best of old methods) can now be forgotten.

CLARENCE W. NOBLE

117 HOME LIFE BUILDING - TORONTO, ONT.

Pine Doors

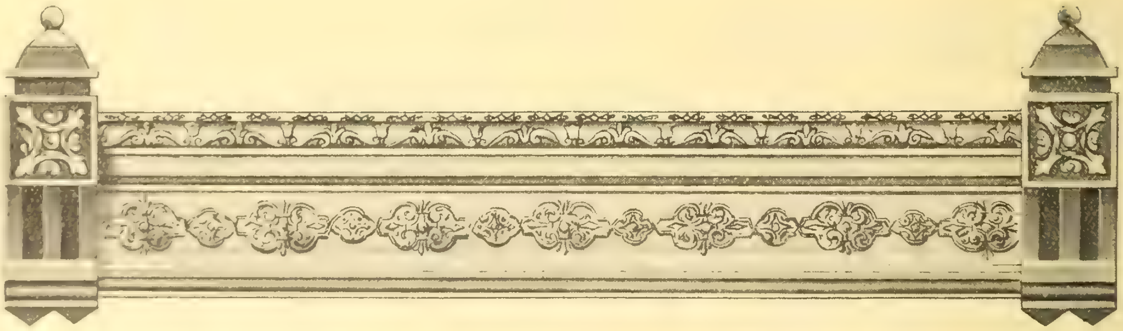
The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. DeLaplante, Limited

212 Main St., Phone Beach 230 **TORONTO**



Expert Workmen Make Our Galvanized and Copper Cornices

Our Cornice Making Dept. contains the most modern machinery and is in charge of expert workmen. Every cornice we make for your contracts will be first-class in every particular—an ornament to the building on which it is erected. On request we will submit suitable designs. We will make to your order any style cornice you desire, in either copper or galvanized steel. Ask for our estimates. Our prices are always very reasonable.

Metal Shingle and Siding Co., Limited

Branch Office and Factory, Montreal, P.Q. **PRESTON, ONTARIO**

Fertile Ground

The most profitable place to **sow** "Tender Advertisements," in order to **reap** the greatest number of bids is space in the

Contract Record

Tenders and For Sale Department

This paper has been used as a medium for tender advertising for a quarter of a century and is to-day Canada's national contractors' paper.

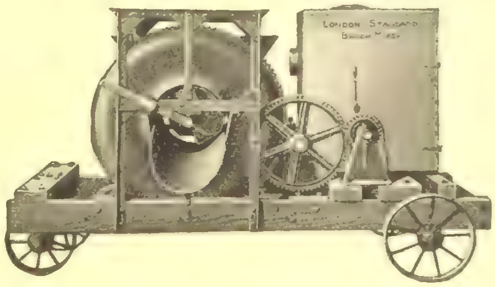
The tender department is widely patronized because our paper reaches the people who are bidding.

Everybody knows "The Record"

Contract Record

Toronto - Canada

London Standard Drum Batch Concrete Mixer



The very latest ideas and improved plans of construction are embodied in this machine. CONTRACTORS it will be well worth your while to write for full particulars.

We Can Save you Money { On the first cost of machine
Cost of maintenance
Cost of producing Concrete

This machine is manufactured in several sizes and with every equipment desired. Let us tell you all about it. State capacity required when writing. We also manufacture the now famous LONDON AUTOMATIC BATCH MIXERS No. 1 and No. 2 Face down Concrete Block Machines, Cement Brick machines, Power Cement Drain Tile Machines, Hand Cement Drain Tile Machines, Sill and Lintel Molds, Ornamental Molds, Cement working Tools and a full Line of Concrete Machinery.

The London Concrete Machinery Company
19 Marmora Street, London, Canada Limited

Manitoba Branch:
W. H. Rosevear, Agent,
52½ Princess St.,
Winnipeg, Man.

Agent for Nova Scotia:
Geo. B. Oland & Co.
28 Bedford Row,
Halifax, N. S.

Agent for B. C.:
A. G. Brown & Co.,
1048 Westminster Ave.,
Vancouver, B. C.

Agents for Montreal: Lemarre Bros., 323 Hibernia Rd., Montreal, Que.

We are the Largest Manufacturers of Concrete Machinery in Canada.

Hardwood Flooring

"Empire" Quality

Just Rockhard Facts

When you want Maple or Beech Flooring of "Empire" Quality, flooring which has been made from good lumber and has been kiln dried and manufactured properly, and grades which have not been "blended" to meet price competition send us your orders.

Competitive stock bought at a lower price is not a good advertisement to you if it results in a dissatisfied customer who will soon forget the difference in price but he will not forget the poor flooring.

Regardless of price our high standard of quality will not be changed, nor shall we try to fool you by mixing grades.

"Empire" Quality results from good lumber, superior millwork, years of experience, and the most careful and systematic attention to detail exactness.

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J. R. Eaton & Sons

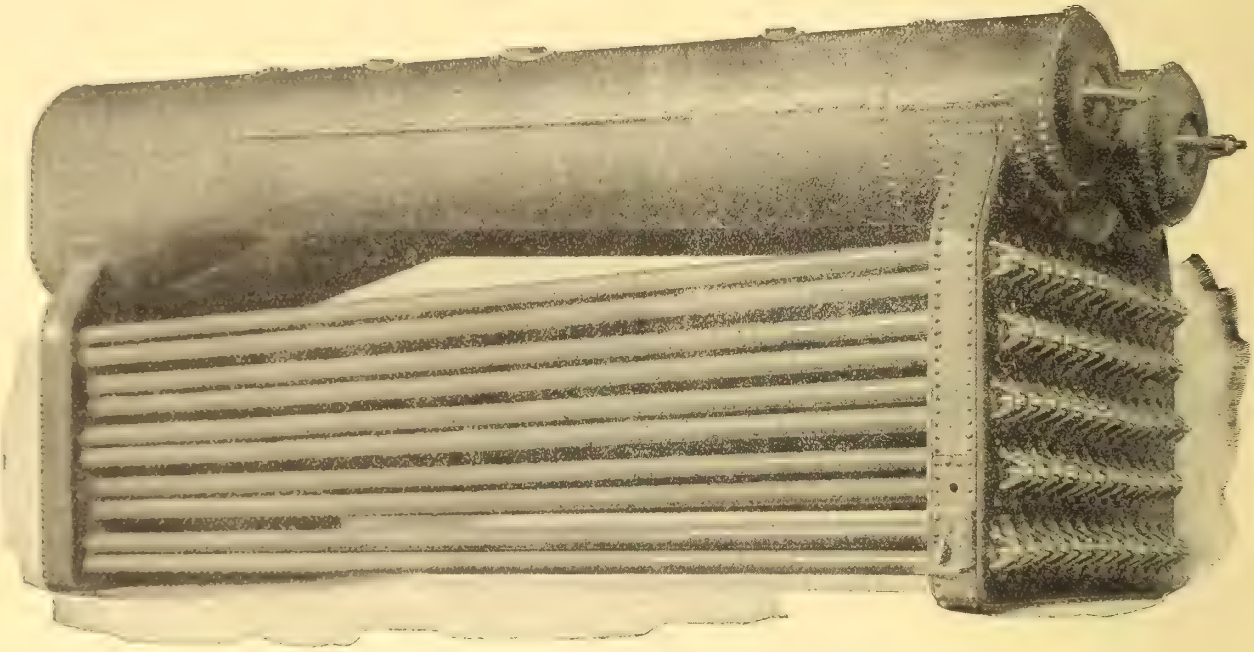
Orillia, Ontario

*Montreal Agent: THE HARDWOOD FLOORING CO.,
55 St. Francois Xavier Street*

Water Tube Boilers

that are

Safe - Durable - Economical



ERIE CITY WATER TUBE BOILER WITH TWO DRUMS

Erie City Water Tube Boilers are "SAFE," "DURABLE" and "ECONOMICAL" because they are properly designed and built in the beginning. Continuous operation for many years has culminated in a thorough system of production, and inspection carried out in all details by officers and mechanics, many of whom have made this business their life work. With such recommendations we confidently solicit the confidence of our customers. If this interests you, write us for catalogue and full particulars.

The John Inglis Company

ENGINEERS AND BOILERMAKERS **Limited**

Canadian Manufacturers of Erie City Water Tube Boilers

14 Strachan Avenue - - TORONTO, CANADA

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Railroads, Bridges and Wharves

Edmonton, Alta.

Tenders addressed to J. E. Schwitzer, assistant chief engineer, C. P. R., Winnipeg, will be received until July 20th for erection of substructure of bridge over North Saskatchewan at Edmonton. Plans, etc., at following offices: A. L. Hertzberg, division engineer, Toronto; C. N. Monsarrat, engineer of bridges, Montreal; N. E. Brooks, division engineer, Calgary, Alta.; H. Rindal, division engineer, Vancouver, B.C., and J. E. Schwitzer, assistant chief engineer, Winnipeg.

Fort William, Ont.

Tenders are being received until July 15 for the construction of piers, etc., for C. P. R. bridge over the Kaministiquia river here. For further information see advertisement in this issue.

Gordon, Ont.

Tenders addressed to A. C. Maillous, township clerk, will be received until June 27th for construction of concrete abutments of a bridge, township of Anderdon. Plans, etc., at office of above.

London, Ont.

Tenders have been called for three reinforced concrete bridges on the boundary line between the counties of Middlesex and Lambton.

New Westminster, B.C.

On July 14th a bylaw will be voted on to issue $30,000 4½ per cent. bridge debentures. W. A. Duncan, city clerk.

Natasquan, Que.

The Department of Public Works, Ottawa, asks for tenders for the construction of a wharf here, until July 19th. Plans, etc., obtained at the department, or at the office of A. D. Decary, district engineer, Post Office Building, Quebec, and on application to the local postmaster.

Ottawa, Ont.

The Department of Railways and Canals are calling for tenders until July 14th for the construction and erection of the superstructure of the La Pas bridge over the Saskatchewan river. For further particulars see advertisement in this issue.

Quebec, Que.

The City Council have accepted the offer of the Transcontinental Railway for the purchase of the Champlain market site. Two million dollars will be spent on workshops, railway station and warehouses. Noted previously.

Tenders are being called by the Department of Railways and Canals, Ottawa, Ont., until September 1st for the superstructure of bridge across the St. Lawrence river. L. K. Jones, secretary. For further information see advertisement in "Tenders and For Sale Department," of this issue.

Strathcona, Alta.

The issue of debentures to the amount of $50,000 has been authorized as the city's share of high level bridge.

Sorel, Que.

Tenders will be received until July 18th for the construction of a breakwater. R. C. Desrochers, assistant secretary, Department of Public Works, Ottawa.

Victoria, B.C.

U. L. Parasew, C.E., with crew, has been dispatched to survey the country for favorable routes for the C. N. R. Garret Hughes, engineer-in-chief, for the railroad's interests on Vancouver Island.

AWARDED.

Cornwall Centre, Ont.

We are informed re Township of Cornwall highway bridges, south branch drainage scheme, that the tender of Quinn & Chisholm, St. Andrews West P.O., for the construction of the five reinforced concrete bridges was accepted by the council. Price, $5,400. Other tenders were: McCoy & Wilford, Lindsay, $6,930; Chisholm & McLean, Glen Walter, $5,500; Meepaw & McDonald, St. Andrews West, their tender being by the cubic yard, price $14; D. G. McMillan, Finch, Ont., also by the cubic yard, price $19.25.

Edmonton, Alta.

The contract for the first section of the C. N. R. from Edmonton to the Pembina river, a distance of seventy miles, has been awarded to McMillan Bros.

Ottawa, Ont.

Burns & Charleston, of Ottawa, were given the contract for wharf extensions at St. Charles de Caplan, Que. ....

Summit, B.C.

The Canadian Pacific is erecting a cold storage and wharves for which one of the contracts has been awarded to Nelson Bros. of Summerland. Total expenditure, $40,000.

Stewart, B.C.

The contract for the first 21 miles of the Portland Canal Shore line has been awarded to Mr. Sol. Cameron, of the Westholme Lumber Company, the cost of clearing the right of way and grading being estimated at $500,000.

Winnipeg, Man.

The contract for 25 miles of the Kootenay Central Railway has been awarded by the C. P. R., holders of the charter, to Foley, Welch & Stewart.

Waterworks, Sewerage and Roadways

Belleville, Ont.

The council decided to call for tenders for both turbine and triplex power pumps, etc.

Foam Lake, Sask.

Tenders addressed to the secretary-treasurer will be received until June 30th for the construction of about 13,000 square feet of concrete sidewalks. Plans, etc., at office of above or at that of F. A. McArthur, Yorkton.

Moose Jaw, Sask.

The ratepayers will vote on July [illegible] for an expenditure of $412,000, which allows for sewerage disposal plant, construction of a fire storage reservoir, providing a filter at Snowdy Springs, the further development of these springs and for extensions of sewers and water systems. $375,000. Construction of concrete sidewalks, $12,000. Permanent improvement work on roads and highways, $20,000, and construction of plank walk, $5,000.

Montreal, Que.

New tenders will be received by City Surveyor Barlow for the construction of the sixth section of the Sherbrooke street sewer. Former tenders having been rejected.

New Westminster, B.C.

The following paving tenders were received: Hassam Paving Company, $62,100; the Rudolph H. Bohn Company, of Chicago, $65,690; Warren Construction Comstruction Company, of Seattle, $66,903. Referred to City Engineer Blackman.

North Toronto, Ont.

At a meeting of the council, Engineer James was instructed to at once build a large well at the northeast of the pumping station, and to install the sterilizing plant.

Ottawa, Ont.

Tenders addressed to the Chairman, Board of Control, will be received until June 30th for asphalt pavement on Mutchmor street from Bank to Canal Driveway. Specifications at office of City Engineer, N. J. Ker.

Quebec, Que.

At a meeting of the civic road committee $175,000 was voted toward permanent repairs to city streets.

Tenders addressed to J. Gallagher, W. W. Engineer, will be received until July 4th for the trenching required for the extension of water and drainage in the new Limoliou ward and in certain streets in St. Malo ward.

Revelstoke, B.C.

A bylaw to raise over $20,000 for waterworks will be voted on shortly.

Regina, Sask

Tenders will be received until July 11th for the following 4½ per cent debentures: $115,000 15-year pavement; $10,000 20-year sidewalks and $280,000 40-year trunk sewer.

Stettler, Alta.

John Galt Engineering Company have charge of the installation of the waterworks system.

St. Boniface, Man.

There is some talk of new waterworks being installed shortly.

Souris, Man.

Ratepayers will vote on July 8th on a $95,000 bylaw for waterworks construction.

Stewart, B.C.

The government has granted $5,000 to assist the installation of a sewerage system, the remaining $5,000 to be subscribed by the townsite company. W. Manson, M.P.P.

South Vancouver, B.C.

Tenders will be received until July 13th for the following debentures: $200,000 road, $10,000 school, $[illegible] sidewalks, to [illegible] H. Peake, C.M.C., Drawer 1, Hillcrest P.O., B.C.

Strathcona, Alta.

The call for tenders for this season's programme of paving resulted in but one tender, that of the Bitulithic Company at $3 per square yard, 25 cents per yard less than last year. The total cost for the areas proposed to be paved, $78,340. Award deferred.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman Board of Control, will be received until July 5th for construction of section No. 6, high level intercepting sewer. Specifications, etc., at the Main Drainage Department, city engineer's office. See advertisement in this issue.

Victoria, B.C.

The tender of the Pacific Coast Construction Company for sidewalk construction on Maple, Quadra, Blanchard, Work and Caledonia streets for the price of $17,532, will probably be accepted.

Vancouver, B.C.

Granatoid pavement on Westminster road to cost $57,400, and a tile drain to cost $21,810, are among the constructions planned by the Board of Works for the season.

The plan of paving Davie street from Granville to Denman, with granotoid pavement was endorsed. The estimated cost of the work is $110,058.

Wallaceburg, Ont.

This municipality is considering the installation of a waterworks system. D. A. Gordon is interested.

Winnipeg, Man.

Tenders are called until June 30th by the Board of Control for construction of sewers in the following: Basswood Place, Erin street, Downing street, Newman street, Wolseley avenue, Wellington avenue, Redwood avenue, Andrews street; M. Peterson, secretary.

Yorkton, Sask.

Tenders are being called by this municipality for the construction of sewage disposal works and sewers. F. T. McArthur town engineer. For further particulars see advertisement in "Tenders and For Sale Department" this issue.

AWARDED.

Lethbridge, Alta.

A contract for 130,000 cubic yards of grading was given to H. Margnardt, at 30 cents per yard, for 1,000 feet haul, and 33 cents for 1,500 feet haul. Other award noted in issue of June 15th.

Longueuil, Que.

At a recent meeting of the council the construction of an 80,000 gallon structural steel tank to cost $5,500 was given to the Structural Steel Company; the 2,300-volt switchboard to the Canadian Electric Company; also street lighting equipment. The pumping outfit complete with motors, piping and valves, costing $3,431, to the McDougall Company and Allis-Chalmers-Bullock, Limited. Longueuil's agreement with the Montreal Light, Heat & Power Company is that the town pay the company at the rate of 30 cents per horsepower with 100 horsepower guaranteed for fire protection. It means that the town gets its total power at an outlay of $1,800 per annum.

Fernie, B.C.

R. Potter, city engineer, sends us the following list of tenders for the construction of 1910 extensions to the water supply system:

Length material.	Depth in feet.	1	2	3	4
11440 feet 3 inches W. I. Pipe....	4—6	.22	.30	.22	.34
500 feet 4 inches W. I. Pipe....	4—6	.24	.30	.22	.34
6770 feet 6 inches Wood Pipe ...	4—6	.25	.30	.34	.34
37 Valves on 3-inch pipe line, each....		3.00	1.00	2.00	2.00
1. Valve on 4-inch pipe line, each....		3.00	1.00	2.00	2.50
6 Valves on 6-inch pipe line, each....		5.00	1.50	5.00	3.00
12 hydrants, 15-foot wood pipe.......		15.00	3.00	20.00	8.00
Total of tender		$4,653.30	$5,696.00	$5,274.60	$6,551.90

The above prices to include the making of the necessary connections with the present lines, also the connecting up the various lines as shown on the plan for same.

No. 1.—R. Potter, city engineer (on behalf of the City of Fernie), (successful tender).

N. 2.—Hugh Macdonald, Victoria, B.C.

No. 3.—Depew, McDonald & McLean Company, Fernie.

No. 4.—Broley & Martin, Fernie.

The following is the list of tenders for construction of a system of storm water sewers:

	Concrete Pipe		Per Foot.		
Size.	Feet Deep.	Total Feet	1	2	3
30-inch	0—6	250	$ 2.15	$ 1.00	$ 1.75
30-inch	6—8	1050	2.30	1.50	2.25
24-inch	6—8	690	1.90	1.40	1.95
24-inch	8—10	240	2.00	2.25	2.25
24-inch	10—12	400	2.10	2.60	2.65
20-inch	0—6	850	1.40	.90	1.40
20-inch	6—8	175	1.50	1.30	1.80
20-inch	8—10	200	1.60	2.25	2.35
20-inch	10—12	320	1.70	2.40	2.60
15-inch	8—10	1440	1.40	2.25	2.00
15-inch	10—12	140	1.55	2.40	2.40
6-inch	0—6	700	.90	.60	.70
6-inch	Underdrain	6300	.10	.15	.10
Manholes, 20, each			50.00	70.00	55.00
Catch basins, 20, each..................			40.00	40.00	30.00
Timber left in ditch, 50,000 ft. B. M. per M.			10.00	15.00	12.00
Totals			$13,703.00	$14,716.50	$15,411.00

1.—J. J. Wood, contractor, Fernie, B.C. (successful tenderer).

2.—Hugh McDonald, Victoria, B.C.

3.—W. M. Dicken & J. P. Horn, contractors, Fernie, B.C.

Port Hope, Ont.

The tender of R. Curran, of Orillia, for the construction of cement walks at 9 1-8 cents per superficial foot and 7 cents for laying tile drains, was accepted. Total amount, $9,861.07.

Quebec, Que.

Mr. A. Leofred, C.E., and constructing engineer, has closed a contract with the Chaudiere Curve Town Council for a waterworks plant to cost when completed, $250,000. Mr. Leofred will start work early in July, and it will take two years to complete the systems. This plant will answer the requirements of more than half a dozen railroads, which are going to cross over the Quebec bridge near Chaudiere Curve.

Strathcona, Alta.

The contract for the sewer and water extensions for this year was given to Hulbert & Wilson at $13,847.95, the third lowest tender submitted.

Toronto, Ont.

The contract for a new pavement in the Union Station has been let to the Warren Bituminous Paving Company. Estimates place it at $2.50 per square yard, or $20,000 for the 8,000 yards to be paved.

Uxbridge, Ont.

M. H. Crosby, clerk, writes that two tenders were received for cement walks, viz., R. Curran, Orillia, at 10 cents per square foot; H. Shurter, Peterborough, at 12½ cents.

Vancouver, B.C.

Evans, Coleman & Evans were awarded the contract for supplying the First Narrows main pipe at $41.20 per long ton. Other tenderers: Robertson, Godson & Company, $41.60; A. G. Langley, $45.60; Porter, Worsnop & Company, $45.11; Western Oil & Fuel Company, $45.44.

Westmount, Que.

The Mineral Rubber Company of Toronto have been awarded the contract for permanent paving for several streets at $145,000. Other awards noted previously.

Winnipeg, Man.

We are officially informed that the contract for supply of sewer pipe and junctions has been awarded to W. F. Lee, of Winnipeg, for the sum of $20,120.25. The contract for supply of from 25,000 to 30,000 barrels of cement was also awarded to W. F. Lee, at the price of 75.45 cents per 100 lbs., including sacks.

Public Buildings, Churches Schools, etc.

Antigonish, N.S.

Tenders are being called immediately for the plastering of the new Science Building, F. X. College, also for the tar and gravel roofing of the same. Plans, etc., at J. A. McDonald's, Barrington street, Halifax, or on application to the above college.

Brandon, Man.

Architect Elliott submitted plans for the new fraternal temple; a site committee, representing Odd Fellows, Knights of Pythias, etc., has been appointed.

Fergus, Ont.

Tenders addressed to R. C. Desrochers, assistant secretary, department of public works, will be received until July 13th for construction of post office here. Plans, etc., at office of W. Mahoney, architect, Guelph, at local post office, and at the above department.

Gunton, Man.

A bylaw will be voted on July 2nd by the ratepayers to issue $10,000 school debentures.

Goderich, Ont.

Plans for the post office enlargement have been prepared and tenders will likely be called for in a few weeks. Government estimates provide $10,000.

Edmonton, Alta.

The bylaws for $175,000 for new public hospital; $75,000 for exhibition grounds; $25,000 for library site, were carired.

It is stated that J. H. Rudy is preparing plans for the new theatre, which will cost about $70,000. H. Fraser, of McDougall & Secord, is interested.

Eganville, Ont.

Tenders addressed to J. R. Campbell, secretary Public School Board, will be received until July 15th for erection of an 8-room school. Plans, etc., at office of above.

Elora, Ont.

Tenders addressed to R. C. Desrochers, assistant secretary, Department of Public Works, will be received until July 13th for the construction of post office here. Plans, etc., at office of the architect, W. Mahoney, Guelph, at local post office, and at above department.

Lambert, Que.

The erection of a post office to cost $7,000 is assured. Mr. Desaulniers is interested.

London, Ont.

City Architect Nutter's plans for the Colborne Street school were favorably considered by the Board of Education. Noted previously.

King street congregation have approved of the site on Dundas street for their new church. Noted in last issue.

Moose Jaw, Sask.

The bylaws to provide $10,000 for fire station on South Hill, $10,000 for isolation hospital, $30,000 for produce market and $10,000 for improvements to exhibition grounds, were carried.

The city clerk has been authorized to call for tenders for the market; also for sub fire station on South Hill; also for construction of isolation hospital, all to be in by July 4th.

Medora, Man.

Tenders will be received until July 2nd for erection of new brick veneer school. A. N. Middleton, secretary-treasurer.

Montreal, Que.

Messrs. Peden & McLaren, architects, are preparing plans and specifications for the erection of a town hall at Montreal West. Noted in last issue.

Work nas been commenced on the construtcion of the Church of St. Matthias, corner Cote St. Antoine and Churchill avenue, Westmount. The foundation work for this building was completed last year. D. M. Long has contract for carpentering work, and P. J. Brown has contract for brick and masonry work. Messrs. Ross & Macfarlane, architects.

Messrs. E. & W. S. Maxwell were the successful architects in the recent competition of the Art Association of Montreal, and their plans for the new art gallery to be erected on the Holton property corner Ontario avenue and Sherbrooke street have been accepted. Mr. Edmund M. Wheelwright, judge of competition.

New Westminster, B.C.

A bylaw will be voted on July 14th to issue $12,000, 4½ per cent. fire hall debentures. W. A. Duncan, city clerk.

Owen Sound, Ont.

Tenders addressed to Forster & Clark, architects, will be received until July 2nd for the erection of school house, No. 1, Keppel. Plans at residence of R. Hewitson, Con. 8, Keppel.

Ottawa, Ont.

It is expected that tenders will be called for in a few weeks for the new departmental block on Mackenzie avenue.

tI is announced that the Bennett Theatrical Enterprises of Canada, Limited, will erect a new theatre here and in Montreal. G. Greening, Canadian manager.

A building permit has been issued for a Hebrew day school, at $4,800.

Princeton, B.C.

The hospital board have decided to call for tenders for their new hospital. Plans furnished by C. Graham, call for a cottage 38 by 53 feet, with large verandahs.

Regina, Sask.

Tenders will be reecived until July 11th for the following 4½ per cent. debentures: $18,000 30-year Isolation Hospital; $26,000 30-year Collegiate Institute; $25,000 30-year General Hospital; $10,000 40-year Children's Shelter.

Rosthern, Sask.

W. W. LaChance, architect, of Saskatoon, has plans prepared for the remodelling for the Alexandra Hospital. Estimated expenditure, $6,000.

Toronto, Ont.

The Synod for Diocese of Toronto is stated to have received a donation of $20,000 toward the erection of an addition to St. Albans Cathedral.

Tenders are being called by the school board until July 4th for the several trades required in the enlargement of Howard school; alterations to Pape avenue school; midsummer repairs; iron stairs for sundry schools, etc. For further information see advertisement in "Tenders and For Sale Deparement" of this issue.

The purchase of $7,000 site for firehall to serve Wychwood and Earlscourt was recommended by the Board of Control.

The time for receiving competitive designs for the residence of the Lieut.-Governor, has been extended to August 19th. Advertisement in issue of June 8th.

Tenders addressed to H. F. McNaughton, secretary of Public Works, will be received until July 9th for marble work, tiling, roofing, conductors, prism lights, plumbing, etc., in connection with the reconstruction of the west wing of the Parliament Buildings. Plans, etc., at office of the architect, E. J. Lennox. J. O. Reaume, Minister of Public Works.

The Property Committee have decided on two new fire hall sites: one on Claremont street, and one on Birch avenue.

Tenders addressed to G. R. Geary, chairman, Board of Control, will be received until July 12th for lighting fixtures required for the new fire hall on Perth avenue. Plans, etc., at office of City Architect.

Victoria, B.C.

Tenders are called until June 30th for alteration to office annex, Parliament Buildings. F. C. Gamble, Public Works engineer.

The executive of the Union Club are considering plans for the erection of a clubhouse to cost about $100,000.

Vancouver, B.C.

The civic building committee have approved plans for alteration at City Hall. Estimated cost, $5,500. Building Inspector Jarrett.

The Daughters of the Empire propose a home for convalescents as a memorial to the late king. J. Tupper, regent; Julia W. Henshaw, secretary-treasurer.

A campaign has been started to raise $100,000 for the new Strathcona Sailors' and Loggers' Institute. Rev. A. Hall, of Toronto, is interested.

Among the permits granted recently were two covering new eight-room schools, each costing $50,000, to be located at Fourteenth avenue and Alder street, and Tenth avenue and Cypress street.

Wolfville

Tenders addressed to J. D. Chambers, chairman of committee, will be received until June 29th for installing a heating plant in the public school here.

Winnipeg, Man.

Two blocks in Transcona have been purchased for His Grace the Archbishop of St. Boniface. It is understood that a church and school will be erected on the property

Tenders addressed to R. C. Desrochers, assistant secretary, Department of Public Works, will be received until July 7th for fittings, examining warehouse. Plans, etc., at above department, and at the office of Mr. J. Greenfield, resident architect.

The school board obtained a permit for the erection of one of the proposed technical high schools, $330,000. It will be of brick and stone, while the floors will be of reinforced concrete. The space occupied will be 219 feet by 180. Architect, J. B. Mitchell.

A permit was issued for the new Catholic hospital which is now being erected at a cost of over $15,000. Also for the construction of a fire hall and drill tower on the northwest corner of Burnell street and Sargent avenue at a cost of $23,000.

AWARDED.

Brantford, Ont.

The contracts for the new Separate school, Brantford, were awarded as follows: Building and construction, J. C. O'Neil, $15,900; heating and plumbing, Howie & Feely, $3,880; electric wiring, Lyons Electric Company, $185.

Ottawa, Ont.

It is stated that the contract for the extension to the eastern deparmenal block has been awarded to Doran & Devlin, this city, the lowest tenderers, at $222,800.

Montreal, Que.

The general contract for the erection of a church building for the parish S. Jolicœur at St. Catharine, County Portneuf, Que., has been awarded to Mr. J. B. Page. Mr. R. A. Brassard, architect.

Messrs. Sparrow & McNeil, contractors, have been awarded the general contract for the erection of a church building for the Church of the Ascension, Park avenue. Mr. H. E. Stone, architect.

The contracts for the erection of the St. Leon school for the Catholic School Commissioners of Westmount, have been awarded as follows: Masonry, J. Lessard; plumbing and heating, T. Lessard & Son; electric wiring, J. A. St. Amour; brickwork, J. Norri; carpentering, J. Prudeau; steel work, Dominion Bridge Company; plastering, J .Fadien; tiling, Robt. Reid. Mr. Jos. Sawyer, architect. Estimated cost, $[illegible]0,000 [illegible] for the erection of a two-storey [illegible] school for the Catholic School Commissioners of St. Paul, corner Church and [illegible] avenues has been awarded to J. B. [illegible], contractor, plumbing and heating to K. Barrette & Company. Alphonse [illegible] architect.

Vancouver, B.C.

The official list of tenderers for incinerator received confirms that published in issue of June [illegible], except in one item, the [illegible] which should read: Hughes & Sterling, London, Eng., per J. E. W. Macfarlane, Vancouver, [illegible]. The contract was given to Public Engineering Company, Portland, O., at $61,121, with the following additions, $6,370 for car system, and $4,000 for the cost of foundation, making total cost, $71,491.

Residences

Brantford, Ont.

Permit has been issued to Mr. P. Gant for a brick dwelling on Dufferin avenue to cost $4,500.

Hamilton, Ont.

Building permits have been issued to D. Mahony, brick house on Fairleigh avenue, $2,500; S. McPhie, brick house, Main street and Spadina avenue, for E. Carleton, $3,-[illegible]

Montreal, Que.

Plans and specifications have been prepared and tenders will be received up to June 30th for the erection of a residence in Outremont for T. Berthiaume. Mr. Theo. Daoust, architect.

Tenders will be received until Thursday, July 7th, for the erection of two houses for Mr. G. A. Campbell. MacVicar & Heriot, architects.

Plans and specifications have been prepared for the erection of a residence for Mr. Herbert Redpath at Ste Anne de Bellevue. Tenders will be received until June 30th. Messrs. Hogle & Davis, architects.

Victoria, B.C.

H. F. Shade has a permit for a dwelling on Queen's avenue, to cost $3,500.

Winnipeg, Man.

E. Curre, it is stated, has invested $32,000 in lots in Transcona, on which he purposes erecting dwellings.

A new apartment block, to be erected on Main street north of the C.P. R. tracks, is being built oy Sharpe and Machray. The contractors are Dunn and Wallace and the architect, A. W. Northwood. Cost, $60,000. F. Ashford was granted permission to proceed with the erection of a three storey annex to his apartment block on Balmoral street, $19,000. The Wilson apartments will be constructed on the north side of River avenue, 139 feet deep, with a frontage of 45 feet. Plans have been prepared by John D. Atchison. Amount of permit, [illegible].

The plans for a residence to be built for D. R. Dingwall at a cost of $8,400, on the north side of Harvard, near Wilton, were approved.

AWARDED.

Montreal, Que.

Contract for the erection of two apartment houses on Dorchester and MacKay streets for Mr. J. B. Stephenson has been awarded to the Hilder Daw Construction Company. House of Brown, Limited, architects.

The Hilder Daw Construction Company have been awarded the contract for the erection of a residence on Querbe street for Mr. A. E. Munday.

Messrs. T. A. Morrison & Company have been awarded the contract for supplying Roman stone requirements, residence for Mr. Ferguson, Ontario avenue. Mr. Kenneth G. Rea, architect.

Messrs. Church, Ross & Company have been awarded the contract for reinforced concrete work on "Magic" apartments which are being erected corner Guy and St. Luke streets for J. S. Prince. T. A. Morrison & Company will supply the Roman stone; brick work contract awarded to A. Brouillard. Mr. Wm. E. Doran, architect.

Toronto, Ont.

A. B. Ormsby, Limited, has been awarded contract for the galvanized iron, slating and duck roofing on the residence for Mr. Jas. Brown, Russell Hill road.

Business Buildings and Industrial Plants

Amherst, N.S.

The Hotel Belmont at Maccan Station, owned by J. Legere, was destroyed by fire on the 20th inst. Estimated loss, $6,000.

Aldergrove, B.C.

It is understood that the Dominion Shingle Company will at once replace the shingle mill destroyed by fire on the 13th inst.

Brandon, Man.

It is announced that Mr. R. Lane will shortly commence construction on his proposed block on Eighth street, which will have eventually a frontage of 75 feet by a depth of 120 feet.

Duncan, B.C.

R. Marpole, vice-president of the E. & N. Railroad, is authority for the statement that a branch from here to Cowichan lake will be erected to connect the $750,000 lumber mill, which is to be erected on tidewater. W. E. Marsh, representing the American Finance & Securities Company, is interested.

Fort William, Ont.

The plans for the new Bank of Commerce to be located on Victoria avenue, have been approved by local manager, A. A. Wilson, and sent to head office for approval. Expenditure, $60,000. Work will start in a few weeks' time.

Farnham, Que.

The contract between the corporation and the Dominion Vault and Safe Company has been signed. The company will occupy the buildings of the defunct C. P. R. shops, besides building a large foundry.

Joliette, Que.

The Copping sawmill here was destroyed by fire on the 21st inst. Estimated loss, $75,000. It is stated that the mill will be rebuilt at once.

London, Ont.

The plant of the Wortman-Ward Manufacturing Company was damaged to the extent of about $20,000 on the 26th inst.

Midland, Ont.

The Roller Rink, owned by W. H. Bennett, and other buildings were destroyed by fire on the 26th inst. Estimated loss, $8,000.

Megantic, Que.

The ratepayers have passed a bylaw to issue $10,000 20-year 5 per cent. debentures as a bonus to the furniture factory about to be started. F. X. Marceau, town treasurer.

Montreal, Que.

Tenders were received up to June 27th for the construction of an office and factory building for the Montreal Smallwares Company, Limited. This is to be a three-storey structure of mill construction. Mr. H. C. Stone, architect.

Tenders for the construction of the new Dominion Express Building to be erected at the northwest corner of St. James and St. Francois Xavier street, will be received until July 4th at the office of E. & W. S. Maxwell, architects.

Plans and specifications are being prepared for alterations to the premises of E. M. Renouf, Limited, on McGill College avenue by Messrs. E. & W. S. Maxwell, architects.

Tenders were received up to June 27th for the erection of an office and factory building for the Diamond Whitewear Company at Three Rivers, Que. Messrs. T. Pringle & Son, Limited, architects.

Plans and specifications are being prepared for the erection of business block, corner Garnier street and Mount Royal avenue for Mr. W. U. Boivin. R. A. Brassard, architect.

New Westminster, B.C.

The erection of a $40,000 cold storage plant is under consideration by the B. C. Packers' Association. Probable site on C. P. R. water frontage or adjoining Cleeve cannery.

North Bay, Ont.

The sawmill, etc., of Chas. Mitchell at Powassan were destroyed by fire on the 23rd inst. Estimated total loss, $7,000.

Ottawa, Ont.

G. Bryson and Russell Blackburn have a permit for alterations, etc., to Crown hotel property to cost $30,000. C. P. Meredith, architect.

Quebec, Que.

The old vinegar works at St. Malo, belonging to Mr. Alfred Robitaille, were destroyed by fire on the 19th inst. Loss, $10,000.

Port Arthur, Ont.

The Bank of Nova Scotia, it is stated, will erect a stone building, corner of Arthur and Cumberland streets. Estimated cost, $40,000. A. Mooney, local manager.

Penetanguishene, Ont.

The ratepayers will vote on July 18th on a bylaw to raise by way of debentures $25,000 for the establishing of a stove foundry.

Pilot Mound, Man.

Fire destroyed on the 24th inst. the McKay block and J. H. Marshall's paint shop. Loss, $25,000.

Preston, Ont.

A bylaw to grant $12,000 to the J. Ballantine Company, etc., in return for which the company promise to double the capacity of their plant as soon as possible, has been carried.

St. John, N.B.

It is reported that the plans for the drydock and shipbuilding plant to be erected here, being prepared by the company with which Sir Robt. Perks is connected, are nearly completed and will be submitted to the government shortly.

Strathcona, Alta.

The council has entered into a provisional agreement with the company known as the Western Clays, Limited, capital, $350,000, as to the establishment of a tile factory here. Mr. H. Richards of the Northern Crown Bank, and Mr. S. H. Smith are interested. For information apply to Dr. L. L. Fuller, 9 Whyte avenue.

South Bay, Ont.
Tenders for the erection of the plant for the Canada Woodenware Company have been called. W. Brown, representative. Noted previously.

Toronto, Ont.
The C. P. R. will come into possession in August of 3 King street east, by means of which they will be able to extend their present offices. It is stated that they will erect a modern office building.

Victoria, B.C.
Dinsdale & Malcolm have drawn plans for a new block for Mr. J. Valo. Noted previously.

Vars, Ont.
Tenders addressed to the Traders Bank of Canada, will be received until July 2nd for the erection of a brick veneer building.

Vancouver, B.C.
A permit has been issued to S. McClay, of Mt. Pleasant, for a $75,000 steel building, corner of Seventh avenue and Westminster road, of five storeys in height, 85 feet by 75 feet, and triangular in shape. A. J. Bird is the architect; permit was also issued to cover erection of hotel block of concrete construction at 915 Westminster avenue, costing $57,000. The proprietor of the Queen's hotel will occupy the building.

Plans were presented to Inspector Jarrett for the building to be erected by the Bank of Montreal at the northeast corner of Westminster avenue and Cordova street. The building will be of stone, two stories in height. Permit was given to Kelly, Douglas & Company for the extension of their present headquarters on Water street. The addition will be seven storeys in height and cost $37,000. G. T. Wallace will erect a four storey brick warehouse at 281 Harris street, costing $15,000.

Winnipeg, Man.
J. H. Pollock will erect a $30,000 block here on Tenth street, which will be used for a billiard room, bowling alleys and baths.

Tenders addressed to James Chisholm & Son, architects, Enderton Building, will be received until June 30th for the erection of a reinforced concrete building on Market street for Gowans, Kent Western, Limited.

Wallaceburg, Ont.
Additions are being considered to the glass factory and the sugar factory. J. L. Wilson & Son, architects.

AWARDED.

Edmonton, Alta.
Messrs. Pheasy and Batson have secured the contract for the erection of Ross Bros.' new four-storey warehouse.

Ottawa, Ont.
The contract for the heating and plumbing of the Chateau Laurier in Ottawa has been awarded to the Garth Company, 26 Craig Street, Montreal, at about $190,000. Architects, Ross and Macfarlane, Montreal. General contractors, Geo. A. Fuller Company, Limited, Ottawa.

Montreal, Que.
Contract for the alterations to the premises of Messrs. Jackson & Savage, wholesale boot manufacturers on 81 St. Peter street, has been awarded to the Hilder Daw Construction Company.

Simpson & Peel, general contractors for the additions and alterations to the St. Lawrence Hall, Craig street, have awarded the sub-contract for painting and decorating to Alex. Craig, 41 Jurors street. Finley & Spence, architects.

Sub-contract for the painting and decorating of the Quebec Bank Building, has been awarded to Alex. Craig, 41 Jurors street. General contractors, Simpson & Peel. Brown & Vallance, architects.

The contract for the heating of the alterations to the St. Sulpice property, 103 St. Xavier street, has been awarded to Mr. H. A. Brosseau, 106 St. Louis street. Architect, Eugene Payette, 15 St. James street.

Preston, Ont.
The contracts for the new I. O. O. F. block have been let, totalling $5,795; building to be completed by October 15th. The following were the successful tenderers:—Wirsching Bros., mason work; Lang & Rosenberger, painting and glazing; Jas. Eagle, carpenter work; Jos. Deemert, electric wiring; Metal Shingle Company, tin work; iron and steel to be supplied by the Hamilton Bridge Company.

Toronto, Ont.
A. B. Ormsby, Limited, have been awarded the contract for the galvanized iron, roofing, doors and windows on the new Nasmith Building.

The Sanitary Flooring Company have been awarded the contract for laying composition flooring, etc., in the new building of Messrs. Lever Bros.' soap factory.

Victoria, B.C.
The contract for the erection of a brick block, on Douglas street, to cost approximately $20,000, was awarded to Dinsdale & Malcolm, by the Drake Hardware Company.

Power Plants, Electricity and Telephones

Edmonton, Alta.
The bylaws to grant franchise to radial railway and franchise for Pintsch gas plant were carried.

Egmondville, Ont.
Tenders are being called until July 9th for the extension of telephone system of the Tuckersmith municipal system. Plans, etc., at residence of Thos. G. Shillinglaw, president, near this place.

Moose Jaw, Sask.
The bylaw to expend $35,000 on extension of lighting system, was carried.

Nelson, B.C.
The $31,000 contract for the second unit of the city's power plant at Upper Bonnington has been accepted. E. M. Breed is district manager for British Columbia, of the Allis-Chalmers-Bullock Company, the engineering company that built and installed the two units for the city.

Ponoka, Alta.
The ratepayers will vote on a bylaw on July 3rd to issue $6,000 electric light and drainage debentures. J. A. Jackson, secretary-treasurer.

Prince Rupert, B.C.
An electric light plant to cost $70,000 has been recommended. V. W. Smith, chairman of committee.

Peterboro, Ont.
It is stated that a well-financed company has bought the Healy Falls, Burleigh Falls and the Auburn (Peterboro) Falls. At Auburn a new concrete dam and power house will be built. The same syndicate has acquired the Peterboro Light and Power Company interests and also the Peterboro Radial Railway, and will build several miles of new street car tracks in the city and vicinity.

Sherbrooke, Que.
Preliminary work has begun at the site of the street railway's new power house.

Stettler, Alta.
This municipality is to install an electric light plant of which, it is stated, the John Galt Engineering Company have charge.

Seaforth, Ont.
The town council has decided to submit a bylaw to the people for the purpose of purchasing 400 horsepower electric current from the hydro-electric commission.

Vancouver, B.C.
Plans have been announced by the Vancouver Power Company, a subsidiary organization of the British Columbia Electric Railway Company, which contemplate the development of 100,000 horse power of electrical energy. To fully develop the two sources of power the B. C. Electric Railway Company will expend ten million dollars. The company has several engineering companies now in the field near the new sources of water power, and state that it is possible operations on the new plants will be started during the present season. Additions to the equipment will be installed as necessities demand.

Windsor, Ont.
The ratepayers decided to grant franchise to the Electric Distributing Company to bring Niagara power into Windsor.

AWARDED.

Seaforth, Ont.
The contract for the large street transformers was awarded to the Packard Electric Company, of St. Catharines, and for the small transformers to the Westinghouse Company, of Hamilton.

Miscellaneous

Cornwall, Ont.
Tenders addressed to L. K. Jones, secretary, Department of Railways and Canals, will be received until June 30th for dredging Cornwall canal.

Hamilton, Ont.
Recent building permits include: Thos. Launders, two brick dwellings, Wentworth street, $3,600; Chas. Brayley, three frame dwellings, Gilkinson street, $3,600; Giles & Beck, brick dwelling, Locke street, for D. Forest, $2,500; James Bryers, brick factory building, Queen street, for Laidlaw Litho. Company, $4,100; Seymour & McKay, two brick dwellings, Burris street, $3,000; Richard Quinn, two brick dwellings, Catharine street, $3,400; Springer & Company, two brick dwellings, Birch avenue, for O. Guldhang, $3,200; E. B. Patterson, five brick dwellings, Young street, J. M. Gibson, $8,500; R. E. Jones, two brick dwellings, Wilson street, $2,800.

Montreal, Que.
Tenders addressed to L. W. Senecal, secretary Board of Control, for the supply and delivery of lead pipe, pig lead and tin, and for the purchase of scrap iron, steel, lead, etc., were received until June 28th. Full information may be obtained at the office of the Board.

New Hamburg, Ont.
Tenders will be called up to July 18th by Wm. Millar, clerk, for the purchase of $8,000 4½ per cent. debentures. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

Outremont, Que.
Tenders for the purchase of $200,000 4½ per cent. debentures for local improvements will be received until July 6th. J. Kruse, secretary-treasurer.

Continued on page 29

Tenders and For Sale Department

NEW HAMBURG

Debentures for Sale

[illegible] by the undersigned [illegible] JULY 18TH NEXT, for [illegible] 4½ per cent. Electric [illegible] of the Village of New Hamburg, [illegible] instalments.

WM. MILLAR,
Clerk.

New Hamburg, June 22nd, 1910. 28

For Sale

Steam Shovel

One style "A" Marion Steam Shovel, 1½ yard dipper capacity, about 45 tons working weight, in first-class condition, with new extra [illegible] boom, latest style new independent crowding engines, all thoroughly overhauled, the boiler just re-tubed. Can be inspected where it is now working. Offered subject to inspection and acceptance before shipment, and subject to prior disposition.

Apply

F. H. HOPKINS & CO.,
28 New Imperial Bank Bldg., Montreal.

To Contractors

Sealed tenders addressed to H. F. McNaughten, Secretary of Public Works, Parliament Buildings, Toronto, will be received at this department until noon of SATURDAY, JULY 9TH, for the marble work, tiling, roofing, including copper work, conductors, prism lights, and slating, etc., plumbing, heating ventilation electric wiring, plastering, painting and glazing, iron staircases and wrought iron work, in connection with the reconstruction of the west wing of the Parliament Buildings.

Plans and specifications may be seen and other information obtained at the office of the architect, E. J. Lennox, 164 Bay Street, Toronto. An accepted bank cheque, payable to the order of the Hon. the Minister of Public Works, for 5 per cent. of the amount of the tender and the bona-fide signatures and addresses of two sureties, or the name of a guarantee company, approved by this department, prepared to give a bond for the due fulfilment of the contract, must accompany each tender. Cheque will become forfeit to the Crown in the event of the successful tenderer refusing to carry out the work within ten days after the acceptance. The department will not be bound to accept the lowest or any tender.

J. O. REAUME,
Minister of Public Works, Ontario.

Department of Public Works, Ontario,
Toronto, June 22nd, 1910.

Newspapers publishing this advertisement without authority will not be paid for it. 26

Newmarket

Tenders will be received up to the evening of JULY FIRST for extension to Newmarket High School.

Building, 40 x 70; two storeys and basement; stone and brick; slate and iron roof; modern plumbing in basement.

Tenders will be received in a lump sum or separately for the various trades.

Plans and specifications may be seen on or after June eighteenth (18th) at the office of the architects,

O. E. TENCH,
26 Queen Street, Newmarket.

Sealed Tenders

marked "Tenders for Bridge," will be received by me at my office, in the County Buildings, in the Town of Cornwall, until 12 o'clock noon, of MONDAY, THE 18TH DAY OF JULY, 1910, for making the necessary excavation and the construction of a reinforced Concrete Arch Bridge over the River De Lisle, on the Military Road about one and one-half miles north of the Town of Alexandria, in the County of Glengarry; also the grading of approaches and the construction of wing-fences. The estimated quantities are as follows:

95	cubic yards reinforced concrete.
232	cubic yards excavation.
4¼	cubic yards rock excavation.
760	cubic yards grading.
342	feet of wing fence.

Plans, specifications, etc., may be examined and forms of tender procured at my office, or at the office of Magwood & Walker, Civil Engineers, Cornwall.

A marked cheque or cash deposit equal to 10 per cent. of the tendered price must accompany each tender.

The lowest or any tender not necessarily accepted.

A. I. MACDONELL, Counties' Clerk,
27 Stormont, Dundas and Glengarry,

Notice to Contractors

Sealed tenders addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, endorsed "Tender for Section No. 6, High Level Interceptor," will be received by registered post only, until noon of TUESDAY, JULY 26TH, 1910.

The sewer consists approximately of 1,340 lineal feet of reinforced concrete pipe sewer, 5 feet internal diameter, extending from Defoe street at Stanley Park in a northerly direction to a point about 500 feet north of Queen street.

Specifications can be obtained from and original drawings will be on file and can be seen at the Main Drainage Department, City Engineer's Office.

For the convenience of contractors, sets of blue prints have been prepared and will be issued to contractors upon the deposit of $5.00, which amount will be refunded upon return of blue prints in good condition within thirty days of receiving tenders.

The usual conditions relating to tenders as prescribed by City By-law must be strictly complied with or the tender will not be entertained.

The lowest of any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman, Board of Control.

City Hall, Toronto, June 23rd, 1910. 26

Canadian Pacific Railway

Central Division

Tenders are hereby requested for the construction of Piers, Abutments and Pedestals for Bridge over the Kaministiquia River at Fort William. Plans, specifications and forms of proposal can be seen at the office of the Engineer of Bridges, Montreal; Division Engineer, Toronto, and Division Engineer, Winnipeg. Proposals must be made out on the Company's standard proposal form, and sealed in an envelope, plainly marked "Proposal for Kaministiquia River Bridge, Fort William." These must be delivered at the office of the Division Engineer, Winnipeg, by 12 o'clock JULY 15TH. The right is reserved to reject any or all proposals.

(Signed) FRANK LEE,
28 Division Engineer.

Sealed Tenders

will be received by the Secretary-Treasurer for the Town of Yorkton, Sask., until 6 p.m, JULY 12TH, 1910, for the following:

Contract No. 1.

Construction of a Sewage Disposal Works for the Town of Yorkton.

Contract No. 2.

Construction of the following sewers:

Approximately 2,900 feet of 20-inch sewer.
Approximately 3,200 feet of 15-inch sewer.
Approximately 1,700 feet of 10-inch sewer.
Approximately 2,800 feet of 8-inch sewer.

Contractors may tender on either or both of the above. Plans and specifications may be seen and forms of tender obtained, at the office of the Town Engineer. A marked cheque for 5 per cent. of the amount of the tender must accompany each bid. The lowest or any tender not necessarily accepted.

F, T. McARTHUR,
Town Engineer.

Town of Yorkton, Sask. 27

City of Moose Jaw
Saskatchewan

Main Drainage Works

Sealed tenders endorsed "Tender A," "Tender B," etc., will be received by the undersigned City Clerk until 8 o'clock, p.m., on MONDAY, JULY 18TH, 1910, for the following:

Contract "A." Supplying material for and constructing Sewage Disposal Plant complete, and laying Trunk Sewer.

Contract "B." (1) Supplying and installing a complete Air Lift System; (2) Supplying and installing one electrically-driven Centrifugal Pump and Auto Starter.

Contract "C." Supplying and delivering 3,000 cords of Field Stone.

Plans and specifications may be seen at the office of the City Engineer, Moose Jaw, and also at the office of the "Canadian Engineer" at the following addresses:

Toronto, 62 Church Street.
Montreal, B33 Board of Trade Building,
Winnipeg, Room 404 Builders' Exchange Buildings.

The lowest or any tender not necessarily accepted.

J. M. WILSON, W. F. HEAL,
City Engineer. City Clerk.

Moose Jaw, Sask., July 16th, 1910. 28

Board of Education

Tenders Wanted

Sealed tenders, addressed to the Secretary-Treasurer, will be received until

Monday Noon, July 4th, 1910

for the several trades required in the

ENLARGEMENT OF HOWARD SCHOOL,
ALTERATIONS TO PAPE AVENUE SCHOOL,
MIDSUMMER REPAIRS,
IRON STAIRS FOR SUNDRY SCHOOLS;

also for

SCIENCE APPARATUS AND SUPPLIES,
FLAGS,
EXPRESSAGE.

Plans and specifications may be seen and all information obtained at the office of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in said specifications and forms of tender. The lowest or any tender will not necessarily be accepted.

W. C. WILKINSON,
Secretary-Treasurer.
W. H. SMITH,
Chairman of Committee.
26

Toronto June 28, 1910.

Department of Railways and Canals, Canada

Quebec Bridge

Tenders for

Superstructure

Notice to Contractors

Sealed tenders, addressed to the undersigned and endorsed "Tender for Quebec Bridge Superstructure," will be received at this office until 12 o'clock noon, not later than SEPTEMBER 1ST, 1910, for the superstructure of a Bridge across the St. Lawrrence River near the City of Quebec.

Plans and specifications may be seen and forms of tender obtained on and after July 1st, 1910, at the office of the Quebec Bridge Board of Engineers, Canadian Express Building, Montreal, and at the Department of Railways and Canals, Ottawa.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signatures, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $500,000, made payable to the order of the Minister of Railways and Canals of Canada, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work at the rates stated in the offer submitted and in accordance with the terms stated in the form of contract accompanying the specifiactions.

Cheques thus sent in will be returned to the respective contractors whose tenders are not accepted.

The lowest or any tender not necessarily accepted.

L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 17th June, 1910.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 28

Department of Railways and Canals

Hudson Bay Railway

Saskatchewan Bridge

Notice to Contractors

Sealed tenders, addressed to the undersigned, and endorsed "Tender for Superstructure of La Pas Bridge," will be received at this office until 12 o'clock noon of the 4TH DAY OF JULY, 1910, for the construction and erection of the Superstructure of the Bridge, over the Saskatchewan River on the line of the Hudson Bay Railway.

The Bridge will be composed of a Swing Span of 262 feet and four fixed spans of 147 feet each.

Plans, specifications and form of contract to be entered into may be seen, and full information obtained on and after this date, at the office of the Chief Engineer, of the Department of Railways and Canals, at Ottawa, Ont., or at the office of the Chief Engineer of the Hudson Bay Railway at Winnipeg, Man.

Tenderers must submit designs of superstructures with stress sheets, all to be in accordance with the general specifications for steel superstructures of bridges and viaducts of the Department of Railways and Canals of the Dominion Government, 1908. The class of load to be used is that designated "heavy" in the said specifications.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the cotnract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation and place of residence of each member of the firm.

An accepted bank cheque for the sum of $10,000, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheques thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 20th June, 1910,

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 26

Miscellaneous

Advertisements under this heading two cents a word per insertion.

FOR SALE—One 50 h.p, return tubular boiler; one 45 h.p. high and low pressure engine. Formerly run planing mill. Also several other boilers and engines of different sizes. THE EVANS COMPANY, Limited, Sudbury, Ont. 26

FOR SALE.—84 pieces Lackawanna Steel Sheet Piling, 22 feet long, 12 inches wide, three-eighths thick, and one 8 foot x 8 inch Buffalo Forge Company Quick Running Engine, in good condition, immediate delivery here, boat or rail. —WM. LESSLIE, Walkerville, Ont. TF

It is reported that Isenberg & Abramovich, builders, Winnipeg, Man., have dissolved.

Menard & Falstrault, lumber manufacturers, Longue Pointe, Que., Arthur Menard and Victor Falstrault, registered.

Claresholm Lumber and Grain Company, Limited, Claresholm, Alta., name changed to Western Canada Grain Company.

Miscellaneous

(Continued from page 27.)

Ottawa, Ont.

The city bonds total $471,707, and include $100,000 for the civic electric plant, $210,000 for local improvements, $60,000 for the city hall renovation, and $30,000 for fire stations. The school debentures amount to $148,800.

Recent building permits include: Miss V. Lees, frame dwelling, Riverdale avenue, $2,500; F. Wilson, brick veneer dwelling, Mutchmor street, $3,000.

Tenders have been called for the construction of the first units of the Canadian navy. It is stipulated that the vessels must be constructed in Canada. It is made clear that none but British firms, either Canadian or English, shall be allowed to compete; and it is also stipulated that the vessels must be constructed on the sea coast, which gives the quietus to any aspirations which lake ship builders might have had for competing. The department calculates that the increased cost of construction in Canada will be at least 25 per cent. over the cost if built in Great Britain, but it is felt that this will be compensated by the industrial development which will follow the introduction into Canada of a number of expert shipbuilders.

Quebec, Que.

The Department of Public Works is asking for tenders for dredging River St. Charles, to be received until July 5th. Specifications, etc., obtained on application to the assistant secretary, Department of Public Works, Ottawa.

Winnipeg, Man.

Recent building permits include: R. G. Owens, house, east side of Chestnut, $3,500; D. R. Dingwall, dwelling, north side of Harvard street, $8,400; R. G. Evans, dwelling, east side of Chestnut street, $3,500; Parcer Bros., three houses, north side of Dorchester street, $12,000; B. Kessnikoff, store and dwelling, north side of Selkirk avenue, $2,800; Moss-Hutton Company, three houses, west side of Lipton street, $3,700; Foley Bros., additions to warehouse, north side Market east of Main, $20,000; J. C. McNab, double dwelling, west side Ruby, $5,000; J. Matthews, six dwellings, north side Morley, $18,000; Smith & Kirkpatrick, two dwellings, west side of Arlington, $8,000; Mrs. J. P. McCrum, there houses, north side Grosvenor, $9,000; H. Haldorson, four houses on Horne street, $12,000; H. Galbraith, five dwellings, Basswood place, $15,000; Newton Stewart, dwelling, southwest corner of Shesnut and Buel avenue, $8,000; L. Rosenblat, terrace, Alfred avenue, between Brown and Sinclair, $2,500; C. Russel, two dwellings, Lipton street, $2,850; T. Eaton Company, shipping shed, Donald street, $4,000; A. C. Stewart, house, northeast corner of Rucklin Row and Park road, $15,000; H. P. H. Gallway, alterations to dwelling, 661 Broadway, $6,500.

AWARDED.

St. John, N.B.

It is understood that A. & R. Loggie, the lowest bidders, have been awarded the contract for dredging in Miramichi Bay at 11 cents per yard. Over 1,000,000 yards are to be removed.

Walkerville, Ont.

O. McKay, C.E., writes that the contract for dredging for the Little River drain, has been let to the Detroit Dredging Company for $5,640, and a further sum of $500 for moving two bridges. The total length of dredging is about 1 5-8 miles.. The quantity, 58,500 cubic yards.

Pile Driver Electrically Operated

The application of electricity in the building trades is becoming greater and the portable or semi-portable steam engine is yielding in part to the electric motor. The small size for a given horse power of the electric motor, its portability, flexibility in operation, readiness to start or stop at any time without trouble, economy in working both in current consumption and cost of attendance, are all in its favor.

One of the latest applications of the electric motor, that of operating a pile driver, has recently been introduced with success by an English firm. This apparatus is fitted with a revolving frame and swivel leaders.

The mechanical gripping device for the monkey is replaced in this electric pile driver by an electro-magnet, the top of the monkey being made smooth and level to afford a good contact surface. The hoisting crab is operated by an electric motor the circuit of which also includes the magnet, the switch for the latter being attached to the crab.

The whole arrangement is decidedly neat and workmanlike, and the many advantages of the electric pile driver will undoubtedly bring it into favor with contracting engineers.

Reinforced Beams and Girders

Reinforced concrete girders, beams and slabs should be designed in accordance with the following assumptions and requirements, says Mr. P. T. Lesher in "The Building Age."

1. The adhesion or mechanical bond between the concrete and steel must be sufficient to make the two materials work together as a unit.

2. The common theory of flexure is to be used.

3. The steel to take all the tensile stresses.

4. Where the upper flange of a beam or girder is a T-section, with a portion of the slab acting as the flange, the width of this slab flange shall not exceed 20 times the thickness of the slab.

5. The junction between the beam or girder and the slab must be of sufficient section or strength for the horizontal shearing stresses, or flange increment taken by the slab. If necessary, stirrups or other metal reinforcements may be introduced to accomplish this purpose.

6. Particular care must be taken so that the slab portion of the T-section of a girder may not be required to act also as a slab, without careful consideration and provision for not exceeding the safe compression on the concrete acting jointly for both purposes.

7. All concrete beams and girders should be made of stone or gravel concrete. All slabs, excepting those between steel beams or girders, not exceeding 8 feet centre to centre, should also be made of stone or gravel concrete. Slabs under 8-feet span between steel beams or girders may be made of cinder or slag concrete.

8. The concrete for the girders, beams, slabs, and columns should be what is known as a "wet mixture," and should be in the proportion of approximately one part Portland cement, two parts sharp sand or gravel, and four parts of broken stone or gravel of the proper size. The stone should be of such size that it will pass through a 1-inch ring, and at least 25 per cent. of the stone should pass through a ½-inch ring. The gravel should be of a corresponding size.

9. The minimum thickness of concrete outside of the reinforcing members of beams and girders should be 2 inches on the bottom and 1½-inch on the sides of the beams or girders. The minimum thickness of concrete under slab rods should be 1-inch.

10. Reinforced concrete girders, beams and slabs should be calculated and designed for upper and lower flange stresses, vertical shear, horizontal shear, and proper adhesion or mechanical bond between the (steel or iron) reinforcement and the concrete.

11. In testing concrete construction it is usual to make the test with twice the live load. That is, if the live load per square foot of floor is 150 pounds, it is usually sufficient to test the construction with 300 pounds live load. This keeps the test within the elastic limit of the materials.

Cleansing Soot from Stonework

Mr. John Mortimer, an old-time Scotch stonecutter, writing to "Stone" says:

"I had some experience in cleaning smoke and soot from house fronts in Dundee, Scotland, sixty years ago. At that time I counted ninety chimney stocks in that town (it is a city now), from the lower hill above the town, so that I presume it was one of the smokiest towns in Great Britain, and a fitting place in which to find a real sooty house front on which to operate. Our employer was John Barrie, who kept a monumental yard and general jobbing shop at the head of Reform Street, and was a real genius for invention and knowledge of stone in its relation and affiliations with other substances and their action and reaction on each other. We were sent to clean a house in Wells street. It was a blue freestone, generally of six or eight-inch ashlar, rather black with sooty matter and also encrusted with a gray moss generated from the sea dampness from the River Tay, on whose northern bank the city stands.

"To remove the sooty matter we used only 'spirits of salt,' or what is now known as ammonia, and clean water. We used a shallow iron vessel with a handle, for the ammonia, so that we could hold it near the stone, while we wet the stone with a rag on the end of the stick, as it is best to keep the hands clear of the fluid. The stone steamed a little on the application of the ammonia, and all the dirt became loose in a few minutes, so that it could be washed off with a rag and clean water. As to the removal of the moss, that was more difficult, and it frequently had to be cut off with a chisel. But I presume that is a matter foreign to this inquiry."

Does Steel Embedded in Concrete Rust?

The effect of concrete in preventing the rusting of steel embedded in it has been the subject of so much controversy that the light thrown on the matter by the electrolytic theory of corrosion is instructive. According to this theory, iron can pass into solution only when an equivalent amount of hydrogen passes from the ionic to the gaseous state, and if the hydrogen concentration is reduced the rusting of the iron will be diminished. This is achieved by adding a strong alkali to the water which is in contact with the steel. According to Dr. W. H. Walker, the caustic lime given off by Portland cement in setting and hardening has this action, and iron or steel embedded in concrete will not rust so long as this caustic lime is present. Unfortunately it is soluble in water, and it is therefore desirable to make the concrete containing steel reinforcement very dense since by so doing the protective properties of the concrete will be maintained for the longest time.

P. D. S. a New Feature

CRUSHED STONE loaded in your wagon from Elevated Pockets at Our Yards

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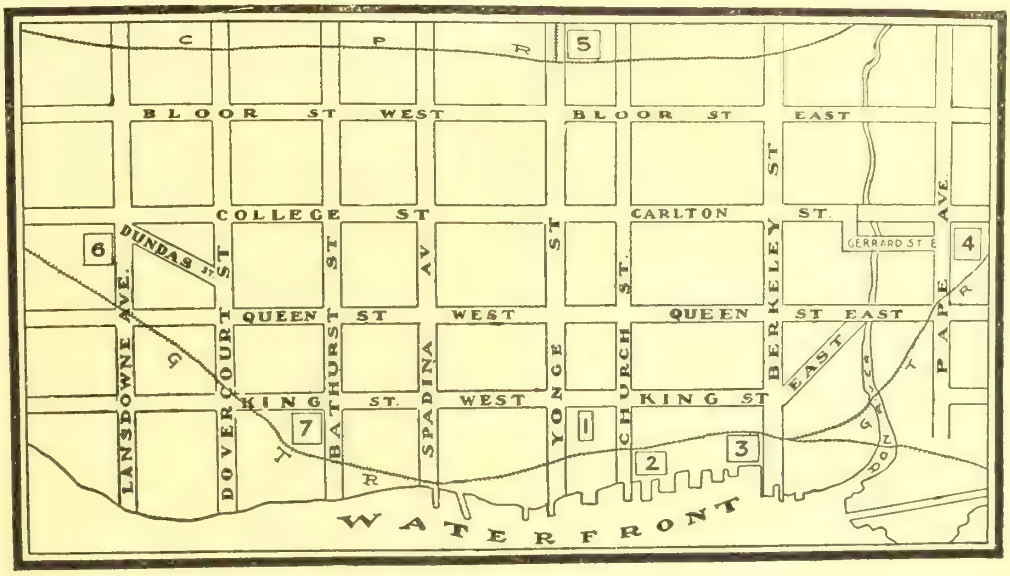

Our record of P. D. S. on Cement we are justly proud of and we aim to surpass it on P. D. S. Stone. Our constant aim is PROMPT DELIVERY SERVICE

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Creosoted Wood Paving Blocks

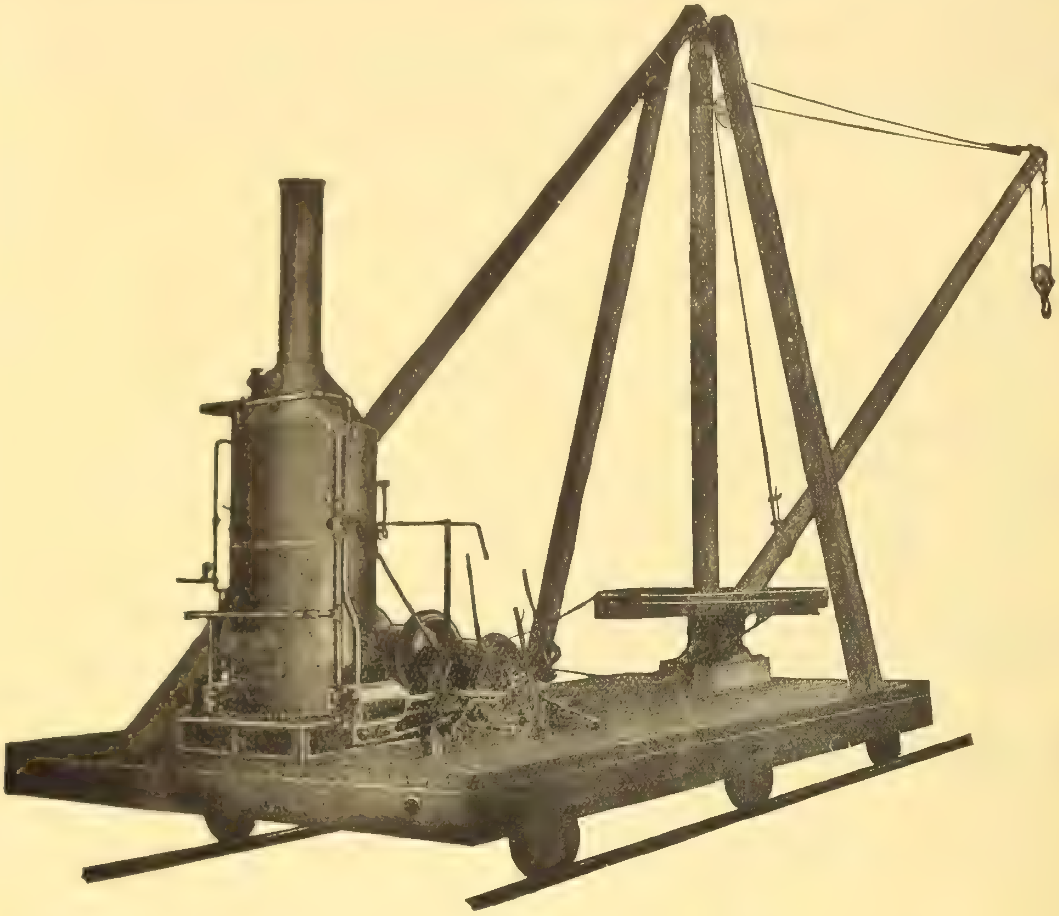
cut from the log in our own mills out of live Douglas Fir and creosoted to specification as to Oil and Pressure. Capacity 1,000 yards per day.

Bridge, Structural and Mining Timbers

cut and sized to exact dimensions, and if so desired, framed in our yards before Creosoting.

Standard Creosoted Railroad Ties

Dominion Carbolineum Works Limited
Vancouver, B. C.



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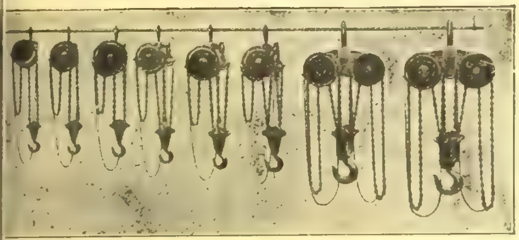

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Winnipeg - 259-261 Stanley St.
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Vancouver - - Mercantile Bldg.

Glidden's Waterproof Flat Finishes

These materials are especially intended for interior use upon sand and rough finished plaster, metallic ceilings and wainscotings and composition surfaces, also beaver board. Made in white and a variety of colors, producing a beautiful, sanitary, soft flat stonelike finish, which can be washed without detriment.

A sand finished surface treated to one coat of Waterproof Flat Finish over a coat of Glidden's Alkali Proof Wall Size, produces a very good result. Two coats are to be used for highest class work. Two or three days allowed between coats, according to weather and temperature conditions. Have excellent brushing and covering capacity, flowing out with a full even surface, free from brush marks.

These materials applied over our Alkali Proof Wall Size produce interior wall decorations of the highest class.

Cover 500 square feet to gallon under ordinary conditions.

Specifications.

When used upon cement, plaster, and similar surfaces apply these materials over our Alkali Proof Wall Size. Brush same well out over the surface to obtain uniform covering properties, thus avoiding laps and brush marks.

When applied upon sand finished plaster, work the material well into the pores.

Upon smooth white plaster finishes we recommend a coat of flat white lead used over our Alkali Proof Wall Size, followed with two or three coats of our Waterproof Flat Finish (color to be selected, or white to be used and tinted to meet architect's desired color scheme).

Upon sand finished plaster surface we recommend two or three coats applied over our Alkali Proof Wall Size, eliminating the coat of flat white lead.

Allow plenty of time between coats for thorough drying. Apply under favorable temperature conditions, preferably 70 degrees F.

When applied to wood and metal surfaces, eliminate Alkali Proof Wall Size and white lead treatment, using two or three coats of the Flat Finish, applying same directly to the surface, which is to be dry, clean and free from rust, grease and foreign matter.

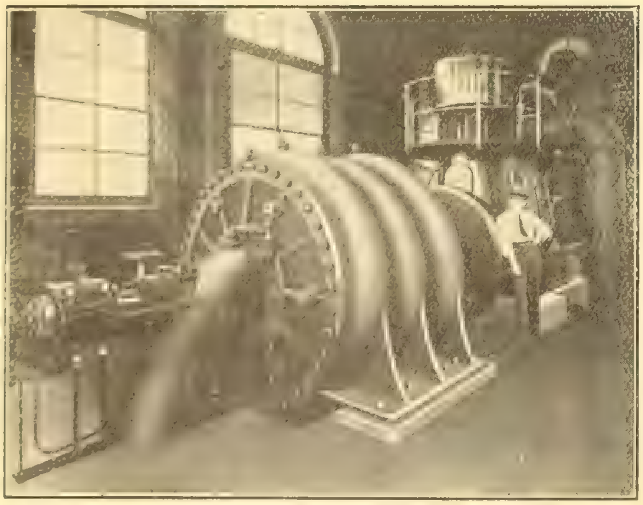
THE GLIDDEN VARNISH COMPANY, Cleveland, Ohio

Distributed in Canada by

Stinson-Reeb Builders Supply Company

Eastern Townships Bank Building
Montreal, Quebec

WATERWORKS PUMPING PLANTS



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THE ILLUSTRATION SHOWS ONE OF OUR WORTHINGTON TURBINE PUMPS DRIVEN BY A 750 H.P. TRIPLE EXPANSION ENGINE IN THE LOW LEVEL STATION OF THE MONTREAL WATERWORKS. IT HAS A CAPACITY OF 12,000,000 GALLONS DAILY AGAINST A HEAD OF 205 FEET.

OVER 80 PER CENT. OF THE TURBINE PUMPS IN CANADA HAVE BEEN BUILT BY US FROM THE DESIGNS AND UNDER THE SUPERVISION OF OUR CONSULTING ENGINEER MR. W. C. BROWN, FORMERLY CHIEF ENGINEER FOR HENRY R. WORTHINGTON, NEW YORK.

WORKS: 512 WILLIAM STREET, MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

Limited

ESTABLISHED 1886
Contract Record
A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

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Vol. 24 Toronto June 29, 1910 No. 26

Wanted—An Expert to Plan a Greater and Better Toronto

Toronto, mainly owing to its natural advantages, is called the "Queen City." Toronto has a population of 350,000, which in another decade will be 500,000. Toronto has wealth within its borders. Toronto has the example of other cities—and she has a committee selected from the Guild of Civic Art and City Council that has done practically nothing but *discuss* improvements the carrying out of which is absolutely vital to the city's future.

One cannot help wondering why Toronto is so shortsighted, why so lacking in initiative. Of what use are advantages, natural or otherwise, if there be not the ability to turn them to their best use; or of opportunities, if those to whom the chance come, have not sufficient ambition to grasp them?

If Toronto does not pretty soon get busy on some enlightened system of civic improvement, the next generation, coping with a task that will have become colossal in comparison with the present one, will anathemize roundly the unpardonable stupidity of their predecessors in having no more regard for posterity than to defer the day of expansion in face of such development.

The problem before Toronto to-day is one that must neither be botched by speculators nor fooled with by amateurs. It is one the proper solution of which can only be worked out by an expert, whose skill is attested by neighboring cities.

Now, why Toronto does not engage such an expert and get something visible and attractive for the citizens to ponder over is hard to understand. The people of Toronto know they have a great city, and one with a greater future, and they will support any good scheme that works systematically, year by year, for a Greater and Better Toronto. Why not get a start on a good plan right now and take Time by the forelock?

There has been enough discussion about the cleaning up of narrow streets, the laying out of new boulevards and parks, the widening of thoroughfares, provision of better transit facilities, playgrounds and so on. It is time now that something was doing,—and Toronto is big enough and, in some respects, *ugly* enough to know it.

The Speculative Contractor

The contractor, in his time, like all the rest of humanity, plays many parts—including that of the speculator. How far does and should the element of chance enter into the business? Perhaps it would be better to ask, firstly, What are the desired qualifications of a contractor? To become a success at the business it is necessary to possess, besides engineering knowledge, keen financial views and business habits; and, what is equally important, the power to resist the temptation of accepting a contract merely because some money will at once be forthcoming which may be useful to patch up the financial liabilities of the last engagement.

It is a great question whether many speculative contractors have retired as rich men. Those who have secured the great prizes in contracting have been those who, whilst, perhaps, taking a few shares in an undertaking because they could not very well help it, have yet generally managed to leave the profit safe to cover even a loss of 50 per cent. on their shares. Yet the speculative contractor seems to some extent to be a necessity, for as enterprise among the public languishes, and the subscriptions to new schemes become less and less in amount, the more shares the contractor has to take up to float the company, and thus many works have been executed the shares of which have afterwards been sold to the public, and finally have risen to a premium. But this is naturally a dangerous game, for the contractor no longer remains a contractor, but a speculator, and this under very peculiar circumstances, for it is his desire to secure the contract which makes him take the shares, and not at all the enterprise. He hopes to sell his shares, and therefore becomes accustomed to treating in these matters quite irrespective of whether the enterprise is likely to be remunerative or not, hence he no longer views schemes with the critical eye with which he would view them if he were merely going to speculate in their success or failure as commercial undertakings. Here he digs his own pit, becoming so accustomed to taking up anything in which he sees a contract, that he at last takes up something which proves an engineering and commercial failure, and is thus left perhaps to bear the whole loss on his own shoulders.

No doubt many useful works have been carried out by contractors thus taking upon themselves the principal weight of the speculation, but it is doubtful whether, if the good and evil of the system could be measured, the balance would not be on the evil side, and whether if contractors looked to pure contracts with cash payments more, we should not see less of those schemes carried through which eventually lead to a great waste of money. Because, although perhaps not exactly objectionable in themselves, these schemes are launched at a wrong time, the contractor taking as payment shares which are created for a much larger nominal capital than would be required if the capital were all subscribed by the public and the contract let for cash to the lowest tenderer. These companies rarely get their shares to par, and very often end in a total failure. Still, to our contractors with their energy, skill and enterprise, we owe much, and there are many who have passed away whose principles and practice may with honor be followed by those of the rising generation who intend to adopt the business.

Waterworks Extension at Owen Sound, Ont.

Details and Plans of Unique and Economical Scheme—Complete Supply Obtained by Gravitation An Increased Pressure of 24 Pounds

The present water supply at Owen Sound is obtained by gravitation from springs having their source from the Sydenham river, and affords a maximum pressure of 70 pounds. The amount of water available is 650,000 gallons a day, the actual consumption of the town. With the developments of the last few years and with the constantly growing demands of an augmented population, it has become necessary to have a considerably increased supply. In order to obtain this, and as no more springs are available, recourse has been had to retaining the present supply from Inglis Springs for use in the valley and in bringing, from the Sydenham river, an increased supply under higher pressure as a domestic supply on the hills, also for street watering and flushing purposes in the valley, and, in case of fire, as a high pressure system through the town. The Sydenham river has a drainage area of 70 square miles and is fed by springs. The river has neither towns nor villages on its banks and flows through purely agricultural country.

Filter Beds in Course of Construction

A brief description of this work, which is now under construction, will doubtless be of interest to many of our readers, inasmuch as a system of this kind for a town of 12,000 population is, in Canada at least, a somewhat unique proposition. From an economical standpoint the people of Owen Sound may well congratulate themselves upon the natural advantages of their location, which have enabled them to dispense entirely with pumps and, incidentally of course, the expenses connected therewith.

In acquiring the riparian rights of owners of mill privileges on the Sydenham river, the damages were arrived at by arbitration. The total amount disbursed in this connection was $15,000.

In order to conduct the water into the filter beds, a sedimentation basin, containing two million gallons, has been formed by the construction of a dam across the river, 1,100 feet frim the filter beds. A 24-inch pipe leads from the sedimentation basin to the filter beds, the water flowing by gravity. From the filter beds the water will be carried by an 18-inch main down the travelled road, a distance of 2,900 feet. At this point a roadway leads westerly to the present springs. A "T" and shut-off valve will be placed here for future connection with the present 12-inch main leading from the springs. On 8th street a 12-inch main will be laid easterly, along 8th street, to the new reservoir. This main will be connected to the present system at two points, one at 10th street and the other at 8th street.

Weiring Flow of Stream

In one of the accompanying views Mr. McDowall's assistant is shown weiring the flow of the stream. In the construction of this dam it was found necessary to resort to coffer-damming. Two coffer-dams were erected, one section at a time over either half of the stream. The dam is of concrete built on the solid rock, a channel 18 inches deep being excavated in the bed of the stream to form the foundation.

The water from the river has been analyzed and found pure, but in order to eliminate all danger of bacterial germs reaching the watershed it was found advisable to have a filtration system. Under this system the river water is passed through two slow sand filtration beds. The area of each bed is one quarter of an acre, and the filtration capacity two million gallons per day. These beds are situated four miles from the centre of the town of Owen Sound.

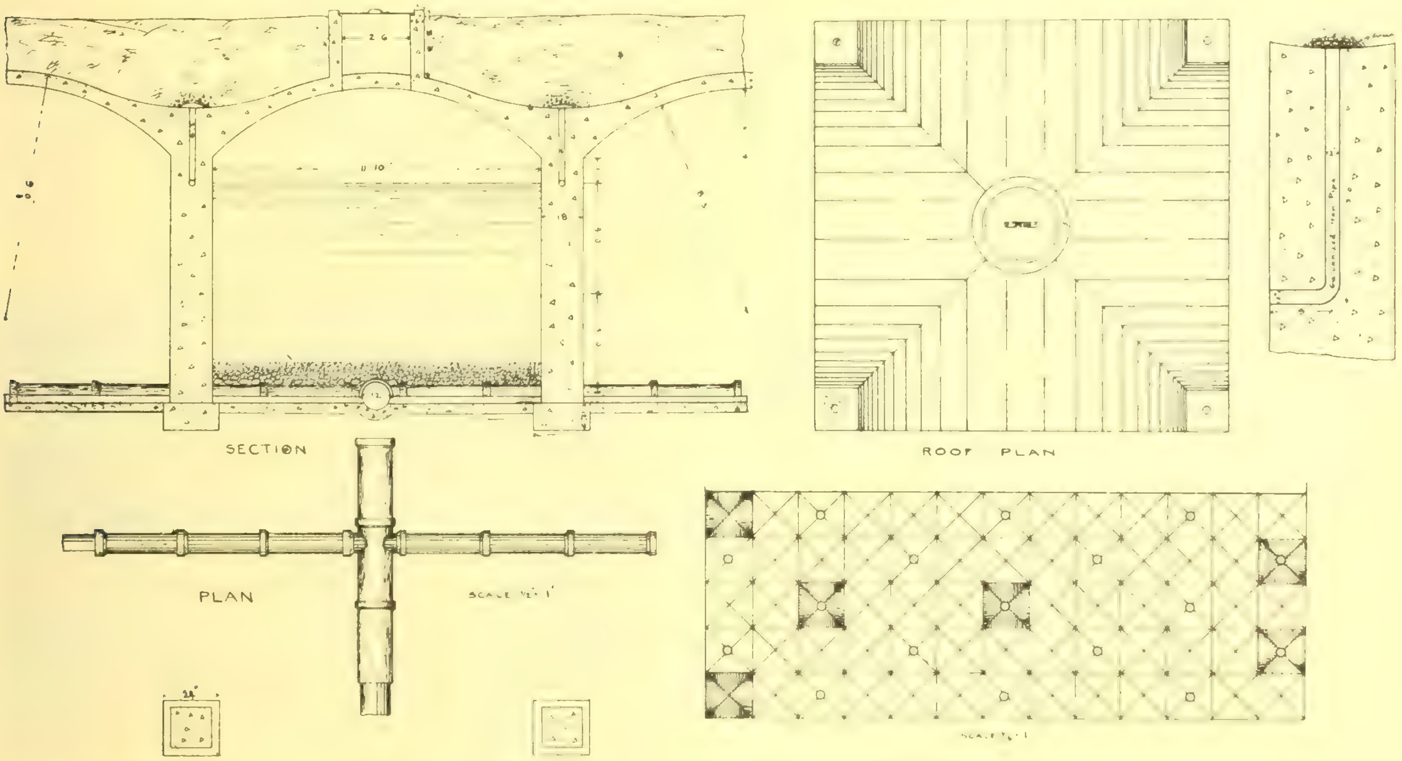
A main water pipe of 18 and 12 inches diameter leads from the filters to the reservoir. The reservoir is situated within the town limits and has a capacity of five million gallons. The elevation of the filter beds above the harbor in Owen Sound is 290 feet and of the reservoir 240 feet. Under the new system, when the present extensions are completed, the town will have a maximum pressure of 100 pounds.

The filter beds are to be built entirely of concrete—

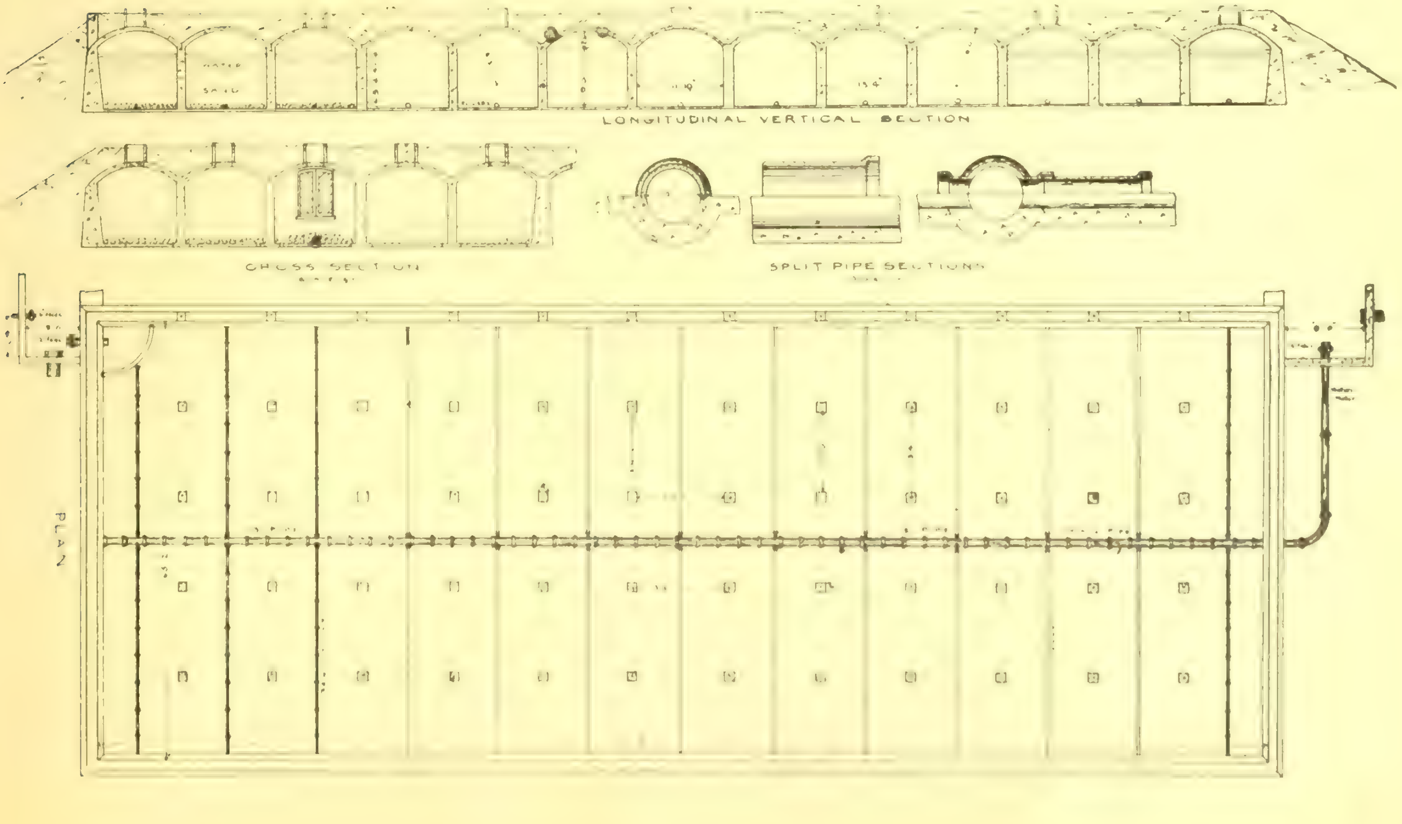
walls, floor, columns and roof. The excavation for the filter beds proved to be sand for 9,000 cubic yards and rock for 700 cubic yards. A circumstance which is somewhat gratifying to the engineer is that the foundation for the beds is solid rock throughout. The roof of the filter beds will be grooved arches and covered with two to three feet of earth. Upon the floor will be a grid-iron of vitrified tile, ranging from 12 inches to 6 inches in diameter. The tile will be laid with open joints. Over the floor and the grid-iron of pipes will be laid a layer of one foot of broken stone thoroughly washed; and upon the layer of stone, a bed of sand three feet in depth. The water to be filtered will cover the sand layer to a depth of four feet. The maximum daily filter capacity is placed at two million gallons.

An explanation of the filtration process is scarcely necessary. Suffice it to say that the water percolates slowly through the sand layers. From the filter the water passes downwards through the beds and into the pipes, thence into a collecting basin and from there to the main, leading to the town.

Loss of head gauges and rate of flow gauges will be



Plan and Details of Filter Beds, Owen Souud Waterworks



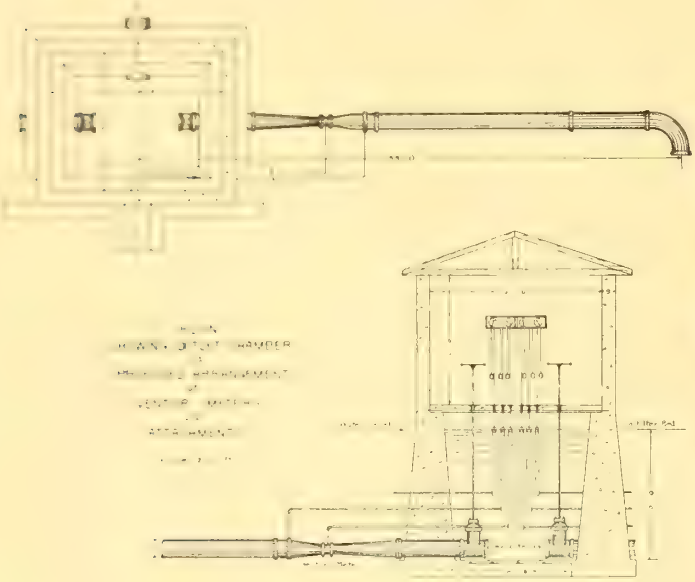
installed in the collecting chamber. When the loss of head gauge shows four feet the percolation is too slow and the filter requires cleaning. The rate of flow gauge registers the amount of water filtered.

Both the filter beds and the reservoir are being built in two separate units so that one can remain in use while the other is being cleaned. In cleaning a filter bed one-half-inch of the top surface is shovelled off with flat shovels and the sand wheeled away and washed. The bed will then require to be renewed to its original depth of four feet. The cost of cleaning filters is about $1.65 per million gallons filtered.

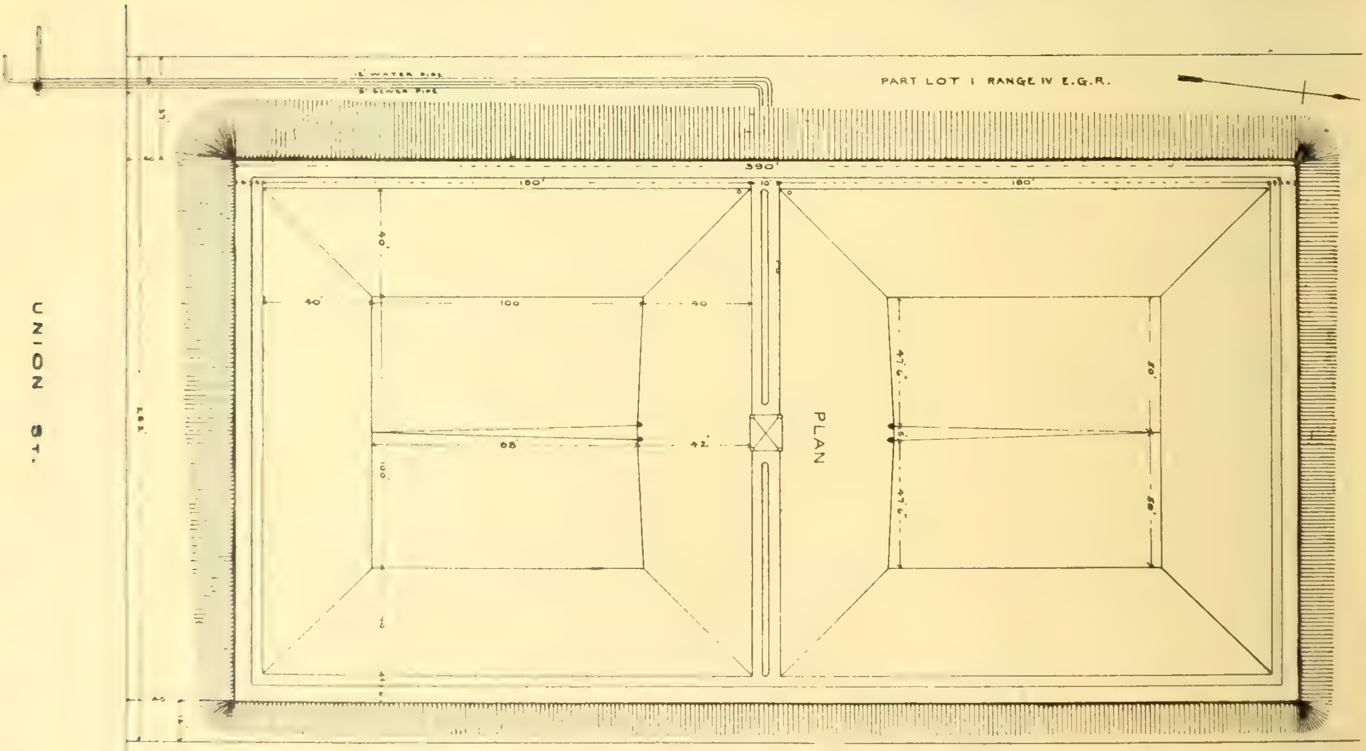
Good progress has been made with this work. Operations were commenced last summer and there is every prospect that the whole project will be completed by the end of August. At present the excavation of the filter beds is completed and the columns are nearly finished. Work will be commenced shortly on the roof. At the reservoir, the excavation has been completed and concrete work is now under way.

The capacity of this reservoir will be five million gallons. It is being built in two parts, each having a capacity of 2,500,000 gallons. The sides of the reservoir will be of earth embankments, one-half ten feet excavated and the other half filled. The floor and side slopes will be lined with six inches of concrete with clay puddle at the back. A valve chamber is installed which will contain a system of valves for governing the flow of water, and opening, filling or emptying either or both of the separate reservoirs. An overflow pipe will be laid from both portions to the sewer so as to have at all times a current flowing in and out of each compartment.

The additional fire pressure which these extensions will give the town will be a valuable asset to Owen Sound. The present extensions will increase the pressure throughout the system 24 pounds. At 10th street and 2nd avenue, where the present pressure is 74 pounds, it will now be increased to 98 pounds per square inch. In case of fire in any part of the town where higher



Excavating for Filter Beds



Reservoir, Capacity 5,000,000 gals.—Owen Sound Waterworks pressure or an increased quantity of water is required, the hydraulic valve at 8th street and 2nd avenue is opened at the fire hall by turning a small hand valve. The whole system will then be connected with the new reservoir and new supply, and will be cut off entirely from the present system. The fire out, the valve is closed and the system returns to the supply from the springs. During the progress of the fire and until the pipes are emptied, the system will be using Sydenham river water.

The total estimated cost of these extensions is $107,000. In a later issue we hope to deal with the remaining stages of the work and to publish detailed costs, which will doubtless be of interest to the engineering profession.

The whole work was planned and is being carried out under the personal supervision of the town engineer, Mr. R. McDowall, C.E., to whom we are indebted for many courtesies upon a recent visit to the scene of operations.

Methods of Washing Filtering Material*

For washing of contact clinker beds after being in use for about five years, the washing plant used may be briefly described as follows: It consists of a movable washing tray and riddle, with inclined screens for grading the material, and which is actuated by steam. The ashes are brought from the beds, and are tipped on an elevated platform approached by an inclined roadway or may be elevated by other means and tipped into the jigging riddle (actuated by a vertical eccentric shaft) which has the first part so made as to retain the ashes and water. The water is applied here until the jigging or shaking motion, assisted by bafflers, removes the undesirable matter which the medium contained and which becomes of the same consistency as very liquid sludge. As the material passes on and over a perforated portion so constructed to suit the sizes of media required, water is sprayed on, and so rinses or thoroughly swills away the sludge along with the material which can pass through the size of mesh. This sludge and water immediately drops on to another inclined plane of corrugated iron, and then on to a smaller mesh wire gauze which retains the smaller particles, say ⅛-inch, and by a mechanical contrivance carried into a wagon ready for removal. The larger material which has had the sludge and fine media removed, which passing, say, a ¼-inch mesh, passes on to an inclined grating formed by parallel bars, say, 2 inches apart, or whatever size is required, the larger material passing on, and the smaller (say less than 2-inch) passing through into a wagon ready for removal, as before described. The fouled media is therefore not only washed, but graded into three different sizes, each size being placed into a different wagon. The sludge and fouled washing water passes from the washer into a wagon which retains the heavier matter which it contains, while the water and light sludge overflows and passes away by means of channels into specially constructed pits or tanks, where the sludge readily settles, and can be drawn away without disturbing the working of the tanks. The sludge, on being drawn away by means of valves, is conducted to the ordinary sludge channel, and is of the consistency of sewage sludge. This sludge, I may say, readily presses. The water may be used over and over again (if required) after passing the tanks.

The machines are made by Messrs. Ransome, Ver Mehr Machinery Company, Caxton House, Westminster, who describe it as a machine for washing and simultaneously grading all classes of material used in the various districts for sewage filtration.

Methods and Cost of Cleaning Sediment from Waterworks Reservoir

The reservoir, known as Reservoir No. 1 of the Cincinnati, Ohio, waterworks, had been in constant service for over two years. It was taken out of service on March 20, 1909, and allowed to stand for four days in order to allow complete sedimentation before drawing the water. The original turbidity of the water was 75 parts per million; after four days it was found to be 47 parts for a depth of 30 feet and 50 parts at a depth of 40 feet. On March 30th the water was drawn off for a depth of 3 feet during the night and allowed to stand during the day, when the mud was washed off the exposed slopes by hose streams under pressure of flushing pumps in the wier house. The following night the water level was again lowered to stand during the day, when the slopes were washed down. This procedure was repeated every 24 hours until April 9th, when the water had become very turbid. The 30-inch drain was then opened, drawing off all the water and such mud as it carried. The deposit of mud remaining on the slopes and bottom was then disintegrated and slid to the drain opening by means of 1½-inch hose streams under heavy pressure. The depth of accumulated mud was found to be from 12 inches to 36 inches, and the total amount removed was estimated as 30,000 cubic yards. Some 35,494,600 gallons of water were wasted in draining the reservoir and 16,902,600 gallons were used for removing the mud, or about 565 gallons per cubic yard of mud removed. The cost of cleaning was as follows:

16,902,600 gals. water, at $3.28 per mil. gals.	$ 55.44
22,032 k.w. electric power, at 1.1 ct.	242.36
Labor operating pumps	57.94
Labor cleaning reservoir	427.27
Total	$783.01

The cost per cubic yard of mud removed was, for cleaning proper, 2.61 cents. Charging in the 35,494,600 gallons of water lost in draining the reservoir at $3.28 per million gallons we have an additional item of $116.42, or 0.39 cent per cubic yard, making a total cost of 3 cents per cubic yard. The cleaning was completed May 1, 1909, and water was turned back into the reservoir on May 8. These data are computed from figures given in the report of Geo. H. Benzenberg, chief engineer, water works, Cincinnati, Ohio.

A fire in an ornamental gable in a Milwaukee public school building recently has led to the decision not to use gabled roofs in public schools there hereafter. The fire is supposed to have started at about the second floor, and to have followed through the walls to the garret, where it was exceedingly hard to handle, being filled with supporting timbers of various kinds, making it almost like a lumber yard. This sort of adornment is therefore to be banned hereafter.

The Prince Rupert Board of Trade has sent a protest to the Dominion Government respecting the regulations governing the immigration of labor. They contend that to shut out all aliens who come from the States, or who do not come direct from their native land on a "through ticket," will injure Prince Rupert and greatly retard the work of completion of the Grand Trunk Pacific

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*Extracted from a paper by A. B. Ogden, read before the Institute of Sanitary Engineers.

Data on Steam Roller Practice of English County Councils

In a recent issue of the "Surveyor" (London), Mr. Walter J. Fletcher, county surveyor of Dorset, gives some data on the general practice of English councils as to steam road roller work. The following extracts may be of interest:

Buckinghamshire owns six rollers, the initial cost being $2,430 each for 10-ton single cylinder Averling & Porter roller, van and water cart. The average cost of rolling is 22 cents per cubic yard, this including attendants, fuel, repairs and water carting. The average numbers of day's work per year per roller is 200. This county also hires rollers to assist in its work.

Bedfordshire owns four steam rollers, the initial cost being $2,469 for a set consisting of roller sleeping van, water cart and scarifier. The rollers are worked from the beginning of November to the end of June. In addition the county council hired rollers the past year for a total of 429 days at $4.80 per day.

Carnarvonshire owns three steam rollers. The initial cost was $2,644 for rollers, sleeping, two water carts and road wagon. The set of three rollers and plant cost $7,932. The total yearly cost of the upkeep was $3,645, including driver's wages, repairs to rollers, fuel and oil. This is $1,215 per roller per year. Coal cost $4.32 to $6.24 per ton. The rollers were worked all the year round except when undergoing repairs and during frosty weather. Cheshire county owns four rollers, the initial cost being $2,673 for rollers, sleeping vans, water cart and hose. The total yearly cost of upkeep is $1,458 per roller, this including wages, fuel, interest and depreciation, etc. The rollers are worked all the year. During the past year the county council also hired rollers at a cost of $1,458.

Durham county owns two sand rollers, the initial cost of the plant being as follows:

Two 15-ton compound steam rollers	$4,991
One Morrison scarifier	428
One traction wagon	170
Two water carts	257
One sleeping van	267

The total cost of upkeep per year is about $1,215 for each roller, this including depreciation, repayment of capital and interest, driver's and assistant's wages, repairs, fuel and water for rolling. The coal costs $2.88 to $3.48 per ton. The council also hires rollers at $5.40 per day, this including driver's wages, fuel, oil, stone, water and use of water cart.

Derbyshire owns seven rollers, a plant consisting of roller, scarifier, water cart and sleeping van. The average cost of upkeep in 1909 was $1,157 per roller, this cost including wages, fuel, repairs, etc. The driver was paid $1.20 per day and the flagman 84 cents per day. Coal cost $3.84 to $4.32 per ton. The rollers are worked all the year, being stopped only in the case of frost and snow. The council also hires additional rollers, paying $4.32 per day and furnishing fuel.

Essex county owns ten steam rollers. The average initial cost of a roller with scarifier attached is $2,040. Sleeping vans cost $243 each and coal wagons cost $97 each. The working expenses for the year ended March 31, 1909, were $9,370, or $937 per roller. The rollers are worked practically all the year, being idle only for cleaning purposes. The county also spent for the year over $17,000 for hired roller.

Gloucester county owns 18 steam rollers, the initial cost of the plant, including rollers, water carts, Dobbin carts and pumps, being $45,684. The cost last year of working 17 rollers was $19,027, or $1,119 per roller. This cost includes wages, fuel, etc. The cost of coal varied from $2.88 to $6 per ton. The rollers are worked all the year, except when idle for repairs. Practically all of the rolling is done by the rollers owned by the county; but rollers are occasionally hired at $5.88 per day.

Kent county owns ten 12-ton compound steam rollers, the initial cost of the rollers being $23,814, or $2,381 each. The vans cost $2,695. The average daily cost of working the rollers, including repairs, coal, waste, scarifying, driver and attendant is $4.80. The average cost of coal is $5.28 per ton. The rollers are worked the year round. About 9/10 of the rolling in this county is done by county rollers. Rollers are hired at about $5.40 per day for the rest of the rolling.

Middlesex county owns three steam rollers. The initial cost of a single cylinder roller with Morrison's scarifier was $2,430. The total cost of rolling, including sweeper, in this county, has been 30 cents per ton. Coal costs $3.12 to $4.20 per ton. The cost of operating the rollers has been about $3.84 per day. The county also hires several rollers, paying $5.76 per day.

Notts county owns four steam rollers, the initial cost of the plant being as follows:

Rollers, each	$1,700
Sleeping van	237
Watering cart	143

The total number of tons consolidated by the rollers was 36,858, the cost per ton being 17 cents. The four rollers worked 1,211¾ roller days during the year, the average cost per day being $5.19. Coal cost from $2.64 to $3.84 per ton.

Northamptonshire county owns two rollers and has one other on order. The initial cost of the roller plant was as follows:

12½-ton compound roller	$2,040
Scarifier	340
Travelling van	364
Two water carts	267

The average cost of upkeep per year, including wages, fuel, repairs, etc., has been $875. Coal has averaged $3.60 per ton. In this county one roller serves for 90 miles of road. The average number of tons rolled per year is 9,000 for each roller. This would make the cost of rolling about 9 cents per ton.

Norfolk county owns 12 rollers, the initial cost of the roller being $20,200. The average cost of the upkeep per year for the 12 rollers for the past six years has been $2,410. The average cost per year of each roller has been $212.

Staffordshire owns seven steam rollers. The initial cost of the plant, which includes seven rollers, six coal wagons, six sleeping vans, 12 water carts and six roller sheds, was $19,000. The average cost of upkeep per year of the plant, including wages, repairs, fuel, etc., has been $6,850, or about $978 per roller. Coal costs from $3.84 to $4.08 per ton. The rollers are worked all the year, except when stopped by frost or repairs. It should be borne in mind that wages in England are much less than in this country, roller engineers receiving about $1.25 per day and laborers about 87 cents.

To prevent spalling at the joints of a concrete floor of a warehouse where the trucking would be heavy, the Aberthaw Construction Company, of Boston, laid the floor with butt joints, leaving no groove. The slab work was stopped against a vertical dam, and the next panel cast solidly against the joint. This scheme has resulted in reducing the spalling to an insignificant amount.

The Handling and Drying of Clay Products

Some Elucidation by a Canadian Machinery Expert—Manufacturers of Clay Products must Improve the Article and Reduce Cost of Production

At the recent convention of the Canadian Clay Products Association, Mr. B. E. Bechtel, Waterloo, Ont., delivered an address which contained many points of interest and value. Mr. Bechtel offered some especially helpful hints regarding drying methods, and we quote the following from his remarks:

"Enough exhaust steam goes to waste from your engine to dry, inside of well constructed buildings, all of your product. You can then work winter and summer, taking little or no thought as to whether the atmosphere be wet or dry. Your drier will work satisfactorily under any condition of weather, and the cost of building a drier is no greater than the erection of the usual outdoor drying apparatus; in fact, in some cases, it is not so expensive, and the up-keep of a good exhaust-steam drier is certainly less than the usual run of outdoor apparatus.

"Solidity and permanence of construction are the keynote in the whole business, and there is no question but that they tend to economy in the long run.

"Another advantage derived from the use of permanent buildings and machinery and inside exhaust steam driers, lies in the fact that you can hire help more cheaply and keep them more permanently, when you work eight or nine months in the year instead of for the usual five months. Another advantage lies in the fact that where you have only a certain demand to supply, you can do much more of the work yourself, and hence do not need to keep so much help, thus again reducing the cost of manufacture.

Improve the Product

"It is not at all likely that the use of brick will be superseded by other materials, but it is certain that the proportion of brick buildings, as compared with other materials, will be diminished, unless we avail ourselves of the stores of technical knowledge which have been gained by those among us who have spent their time and substance in experimenting with a view to improving the product and cheapening the cost of its manufacture. No one to-day should expect to do everything for himself. That course was good enough in bygone years, but we have now grown too complex in our civilization. The man succeeds best in this day who best knows how to avail himself of the knowledge which has been gained in the past, and who starts out in the light of other people's failures and not in the darkness of their beginnings.

"In southern countries, such as the range of States along the Gulf of Mexico, where nearly every day is bright and sunny, with a dry air and tropical sun, the drying of brick is a very simple process and can be made a question of common labor solely. It is also very little a question of technology, because nature has done and will continue to do almost all the work with very little artificial assistance; but in the cool, moist atmosphere of Canada, where frost interferes with outside drying for the greater part of the year, and where frequent rainy and cloudy days break into the summer months, the drying of brick must become an artificial process, if we wish to obtain economic results at all commensurate with the necessities of our requirements.

"The fundamental considerations here are therefore the generation of heat by the combustion of fuel, the use of this heat in the vaporization of water, the relative volumes and weight of gases under all sorts of conditions, the movement of bodies of gases by stacks and fans, the amount of air to do a given amount of drying work, and the allowance necessary to be made for the friction of walls, the turning of the flues and the surface of the wares to be dried. But above all this comes the recognition of the peculiarities of the clay itself, its physictl factors, its fineness of grain, its plasticity, its shrinkage, its moisture-retaining qualities, its surface characteristics, its capillarity, its tenacity, its absorption, and all the factors of safety which these considerations entail in the design and operation of a drier for clay wares.

"The testing of various kinds of clay as regards these qualities, divides them, generally speaking, into what may for our present purpose be defined as two classes: 1st, those which dry easily and without cracking or checking; 2nd, tender clays, or those which require to be handled carefully in order to prevent cracking or checking.

"Generally speaking, clays which are mild and contain a large proportion of sand are not tender clays; they dry without much appreciable shrinkage. Clayworkers who have this kind of clay do not require an elaborate system. They can use the simplest form, and therefore the most compact and least expensive form of drier. Let it not be supposed, however, that any kind of drier will do for this kind of clay, if you can wish to get the best results. A great many mistakes can be made and are made by those who rush headlong into the construction of a drier, without first taking into consideration all the peculiarities of their own particular kind of clay.

Assembling of Machines

"The assembling of the various kinds of machines and appliances must be carefully considered by the engineer, in the light of the knowledge of the particular kind of clay to be dried. All of these parts must be chosen by one who has a practical knowledge of their working qualities in the internal economy of the drier which they are intended to fill. The failure of any one part means the failure of the whole, so far as the satisfactory working of the drier is concerned, in the same sense as the strength of the chain is the strength of its weakest link. The size of the buildings, number and size of flues and their construction as compared with the capacity of the machinery, must be taken into consideration. All must work harmoniously together, with the least possible amount of friction, in order that economy in drying may be the result.

"The drying of tender clays, however, is a much more difficult problem. While the builder of your drier must make special provision for the handling and drying of your particular product, much more depends upon your own careful handling of the means placed at your disposal.

"Your problem is a more difficult one, but that is not the fault of the drier, but the fault of your particular kind of clay, and it becomes your duty to make the most of that with which you have been provided.

"If a hot, dry air is forced among brick of tender clay as soon as they are made, they will crack and check, as they will crack and check in the sun and wind. The temperature of your air and its humidity is a vital con-

[illegible]. If your air is too dry it is a very easy matter to fill it with moisture. Hot air filled with moisture will not crack or check tender clay, even if the blast is strong, but it will if continued long enough raise the temperature of your brick to the desired heat. Now the humidity of your air may be lessened, and the process of drying begin without danger of checking and cracking of the product. Necessarily it takes considerably longer to dry brick made of tender clay, and the expense is therefore greater, but the careful brickmaker soon learns the peculiarities of his clay and tempers his blast so as to get the most satisfactory results.

"A method of handling tender clays to make them less liable to crack in the process of drying, is to mix, where possible, a proportion of sand, and, if this is not procurable, grog may be used. This is easily made from broken brick and tile, or even from burned clay, which may be very cheaply made if your kilns are properly constructed with that object in view. The use of slack coal or sawdust is also a valuable adjunct, and, if sparingly used, will not detract from the value of the product materially, either in strength or appearance. It possesses the additional advantage of assisting in the burning of the ware, if care is taken to supply a sufficient quantity of oxygen to the kiln during the process of burning."

Building Rules for Water Tanks

The following is the clause in the Toronto by-law governing the erection of water tanks:

"Water tanks erected over roofs of buildings shall be supported on sufficient brick bearing walls or beams, and pillars of metal, and the erection of a water tank on any old or new building shall not be commenced until plans and specifications of the tank and its supports have been submitted and approved of, and a permit obtained to erect same from the inspector of buildings."

At Vancouver, B.C., the regulations covering the point are as follows:

"Tanks containing more than 500 gallons of water or other fluid hereafter placed in any storey, or on the roof of any building now or hereafter erected, shall be supported on iron or steel beams of sufficient strength to safely carry the same.

"All the beams shall rest at both their ends on brick walls or on iron or steel columns or piers of masonry.

"Underneath any said water tank, or on the side near the bottom of the same, there shall be a short pipe or outlet not less than four inches in diameter, fitted with a suitable valve having a lever or wheel handle to same to discharge the weight of the fluid contents from the tank, in case of necessity, unless tank water is to supply automatic sprinklers.

"Such tanks shall be placed where practicable at one corner of a building, and shall not be placed over nor near a line of stairs, unless the stairs are enclosed with brick walls of sufficient strength to support the added load of the tank and contents."

A Word from Winnipeg

Mr. William Bruce, a well known architect of Winnipeg, Man., says that the authorities of the western capital should take warning from the calamity at Montreal. He writes:

"Nearly two years ago I directed attention to the defective building by-law, and got classified as an "old crank" by certain members of the council and some of the city officials.

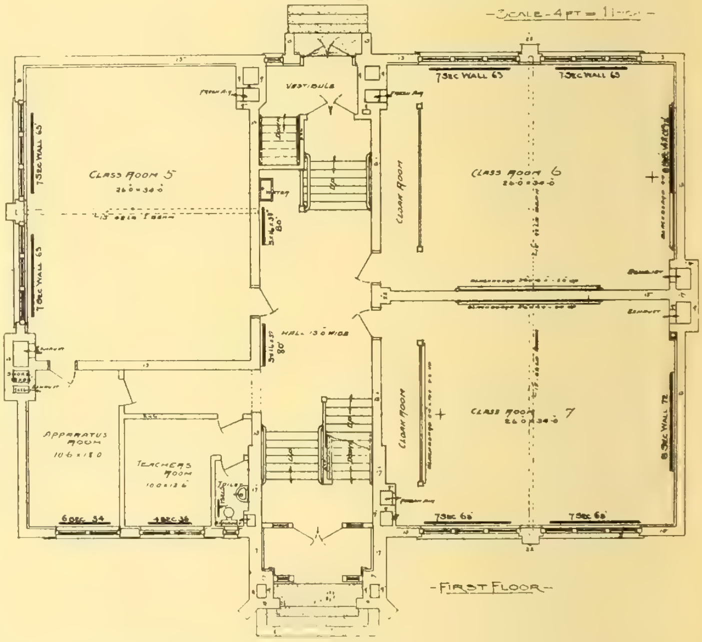
"Including the tank with its load of water, and the usual load on the floors, I have seen the dangerous and very excessive load of 18 tons per square foot, on some brick work, in this city. That is about three times more than should be placed on local brickwork, when considering the height and area of some of the brick piers.

"Another very dangerous feature of water tank construction is the omission of lightning conductors to efficiently connect the metal framework that carries the tank, with the earth. In addition to the metal supports of the tank there are the fire escapes and water pipes for hose on the outside walls. All erections of this kind should have conductors properly connecting all such metal work to the earth.

"How long are the fire, water and light committee to allow dangerous structures to be erected in this city, and when may we expect an up-to-date building by-law, and buildings erected according to the plans that are formally approved of?"

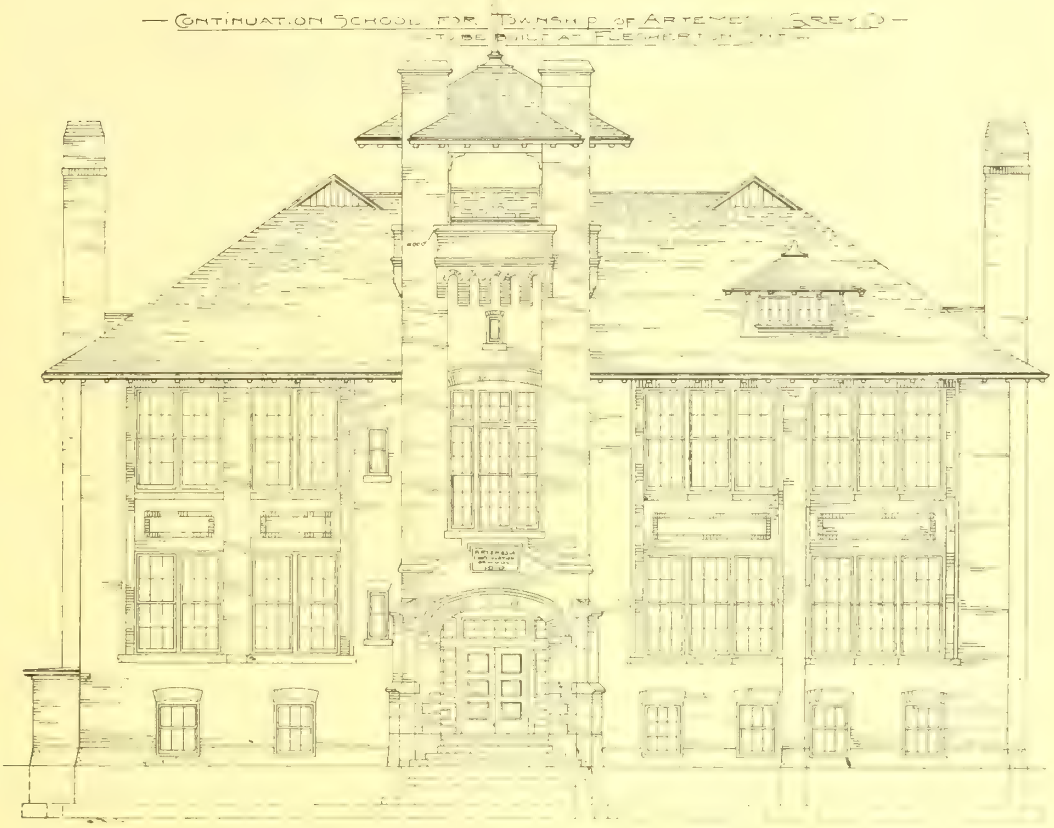
Artemesia Township School

The Artemesia school, illustrated herewith, will be the first continuation school to be built in Ontario. The dimensions of the school will be 78 feet x 56 feet, and the cost approximately $13,000. The specifications call for concrete foundation, 13-inch brick walls and trussed roof. Steam heating will be installed. The ventilation will be on the most modern principles. Direct wall radiators will be provided for heating and indirect for ventilating. The latter are placed in fresh air rooms, fresh air being conveyed direct from the outside through the radiators into the rooms. The basement provides for boiler and feed room and separate play rooms. The school will be erected according to plans prepared by Forster & Clark, architects, Owen Sound.



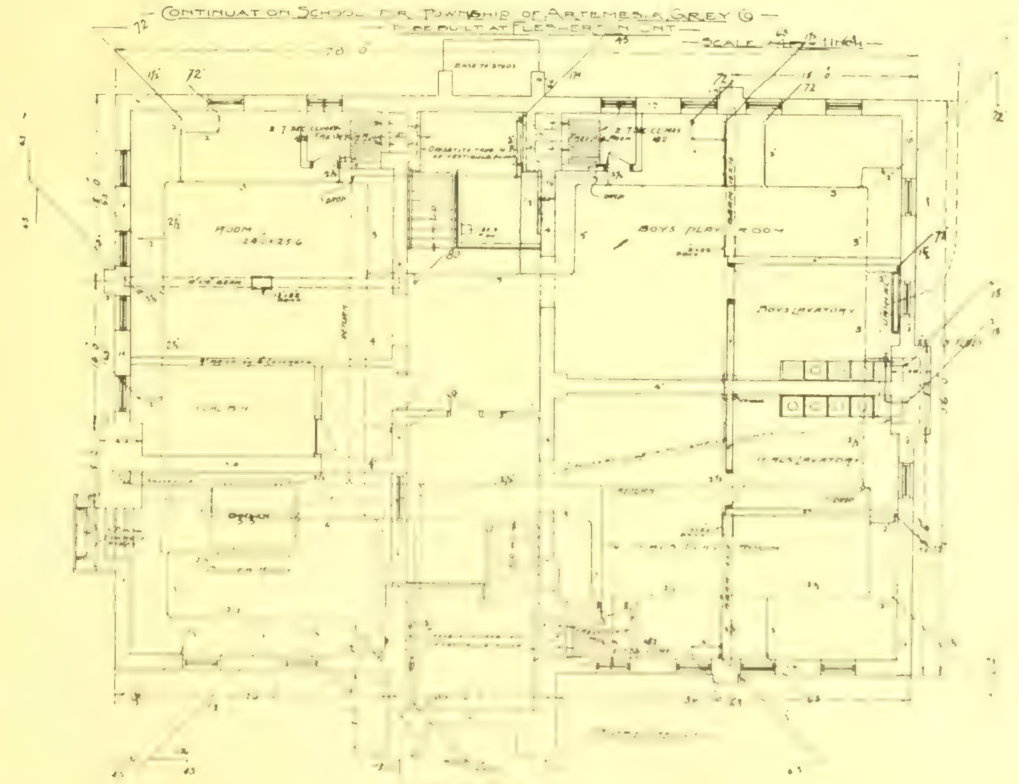
Messrs. Peter Lyall & Sons, general contractors, undertook the task of removing the debris and bodies of victims from the ruined Herald Building when the civic workers gave up the task. The walls remaining standing were also placed in a safe condition by this firm. The Montreal Street Railway Company's steel freight cars rendered an excellent service in removing the rubbish. It is fully expected that a new building will be erected at an early date on the site of the disaster.

A meeting of the Council of the Royal Architectural Institute of Canada is called for July 11th at 5 Beaver Hall Square, Montreal.


Continuation School for Township of Artemesia Grey Co
To be built at Flesherton Ont

Front Elevation Artemesia Township School

Architects: Forster and Clark, Owen Sound, Ont.


Continuation School for Township of Artemesia Grey Co
To be built at Flesherton Ont
Scale
Room 24 x 25 6
Boys Play Room
Boys Lavatory
Girls Lavatory

Installation of Modern Steam Heating

How to Figure Radiation—"Avoid Rule of Thumb" Methods in Calculating Requirements—A Practical Talk to the Heating Engineer

Steam heat has been so long in use and its advantages, especially for buildings of large size, are too well known to make necessary any argument as to its efficiency and success. We will consider briefly the best methods of installing such a system together with the rules for figuring amount of radiation, pipe sizes, and so on.

The modern low-pressure system of steam heating is usually a gravity job, the boiler or steam generator being placed below the level of the steam mains. While the two-pipe system is still at times advocated and employed, practically all of the installations of low-pressure steam heating in these days are erected by what is known as the one-pipe method.

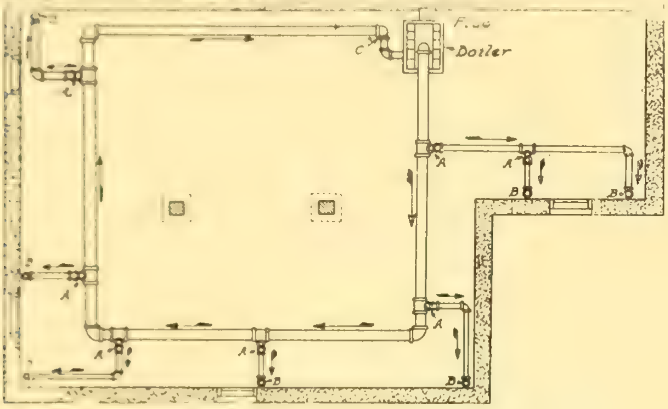


Fig. 1—One-Pipe Circuit System of Steam Heating.

There are several adaptations of this method—namely, the "one-pipe circuit" system, the "divided-circuit" system, the "one-pipe system with dry returns," the "one-pipe system with wet returns," etc.

In planning for the installation of a low-pressure steam heating apparatus, it is necessary to figure the size of radiator needed for each room to be heated; and after the total amount of radiation has been determined, the proper size boiler can be figured.

How to Figure Radiation

The amount of radiation required depends upon three factors: (1) the size and location of the room; (2) the square feet of its glass exposure (windows and outside doors counted as glass); and (3) the square feet of outside or exposed wall surface. Too many fitters and contractors are using "rule of thumb" methods in calculating such requirements, thereby causing trouble and unsatisfactory results from installations of this character. Only such rules as are absolutely accurate should be used in figuring on work.

The Mills rule, known also as the rule "2—20—200," is easily applied, and it is the one generally used by heating men. Its explanation follows:

> Find the following three quantities in each room to be heated: (1) the cubic feet of contents, by multiplying together the length, width and height; (2) the square feet of exposed or outside wall (not deducting the space occupied by doors or windows); and (3) the square feet of glass (counting outside doors as glass). After obtaining these results proceed in figuring thus:
>
> For each 2 square feet of glass, allow 1 square foot of radiation; for each 20 square feet of exposed wall, allow 1 square foot of radiation; for each 200 cubic feet of contents, allow 1 square foot of radiation.

The total of these different results will be the number of square feet of radiation required to heat the room to 70 degrees with a pressure of 2 pounds of steam, the outside temperature being at zero.

For example, consider a corner room (two walls exposed) having three windows 3x6 feet in size. Dimensions of room, 15 by 20 feet, with a 10-foot ceiling.

3 ft. × 6 ft. = 18 sq. ft. × 3 = 54 sq. ft. of glass
15 ft. 20 ft. = 35 ft. × 10 = 350 sq. ft. of exposed wall
15 ft. × 20 ft. × 10 ft. = 3,000 cu. ft. of contents
54 ÷ 2 = 27
350 ÷ 20 = 75.5
3,000 ÷ 200 = 15

Total.... 59.5 sq. ft. of radiation required

Having determined the number of square feet of radiation necessary to heat the building, we proceed to the selection of the boiler.

The selection of a boiler of sufficient size means much for the efficient and economical operation of the entire job.

The catalogue ratings of all boilers for house heating, or "low-pressure" boilers, are gross ratings; that is, in the stated capacities, not only is the amount of radiation to be supplied considered, but all pipe, fittings, etc., on the work are counted as radiating surface, and allowance must be made for the same in accepting the printed ratings.

A safe plan when using such ratings, is to make the following allowances:

Actual square feet of radiation in building	600
Add 25 per cent. for uncovered mains and risers	150
	750
Add 20 per cent. for friction and condensation loss...	150
	900

showing that for good service on the boiler the boiler selected should have a gross rating of approximately 900 square feet.

For economy, choose a boiler so constructed that it may be easily and thoroughly cleaned in all its parts. Soot is a great non-conductor; and the heating surfaces, to be effective, must be kept free from an accumulation of it.

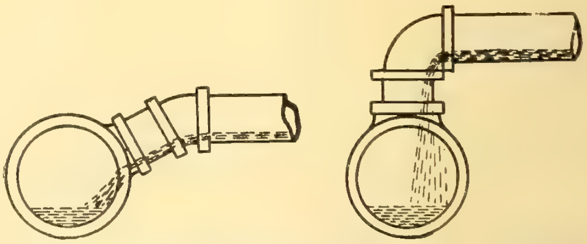


Fig. 2—Illustrating how Steam is Saturated by 90-Degree Connection to Main.

The firebox and grate provided are features worthy of particular attention, as a firebox of proper depth, and a type of grate which can be easily cleaned and which is able to carry its full load of fuel without a sagging of bars, are essential points to consider.

A large amount of direct heating surface above the grate, with a length of fire travel sufficient to consume and utilize the gases of combustion, means economy of fuel.

One-Pipe Circuit System

The one-pipe circuit system of steam piping is doubtless used more than any other plan, as it is the one having the most advantages when installed in a square or rectangular building.

In this system, the upright pipe out of the boiler rises to as high a point as possible, up to within a few inches of the cellar joists. On its top is placed an elbow from which the circuit is started. This starting place is the high point of the main steam pipe; and from it the main should have a gradual fall or pitch from the boiler of ½ to 1 inch in each 10 feet of length. The branches should pitch up from main at least 1 inch in each 5 feet of length, and as a rule should be of one size larger pipe than are the risers which they feed.

The circuit continues around the basement at a distance of from 3 to 4 feet from the outside wall, continuing until an advisable point at or near the boiler is reached, where a reducing elbow is placed on the end of this main, and a drop made with a smaller size of pipe into the return opening of the boiler.

Fig. 1 shows the basement plan of a piping job of this character. The main acts as a reservoir supplying the various branches leading to the radiators, and also as a return pipe receiving the condensation from the various branches it feeds. By reason of this latter function, it should not be reduced, but should be run full size from the boiler to the end where the return connection is made. The condensation from the system runs along the bottom of the main in the same direction as the course of the steam.

At the extreme end of the main, where the connection to the return is made, there should be placed an automatic air-valve, in order that all air in the main may be quickly exhausted, and the main put in shape to be rapidly filled with steam so that all branches will be supplied at practically the same time, thereby securing an equal proportion of heat for all radiators.

Each branch connection may be taken from the main by either of two methods—namely, (1) by using a nipple and 90-degree elbow, and (2) by using a nipple and 45-degree elbow. The first method is preferred for the reason that in all low-pressure mains the steam flows along the top, the condensation along the bottom. With the 45-degree connection, the condensation from each branch enters the main without saturating the steam, while with the use of the 90-degree connection this water of condensation flows into the main on top of the steam supply, saturating it and thereby greatly reducing its efficiency. This difference is very clearly explained by fig. 2.

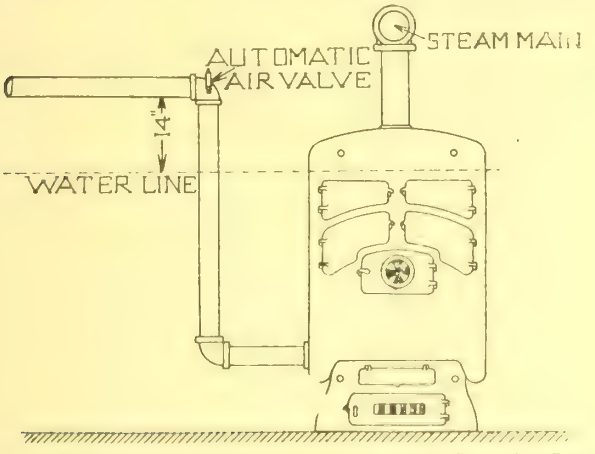


Fig. 3—Elevation of Boiler and Return Connection of a One-Pipe Circuit System of Heating as Shown in Plan in Fig. 1.

Points marked A A A on fig. 1 indicate the 45-degree connection; B B B, the risers to radiators; and C the point at which the automatic air-valve should be placed. The arrows indicate the downward pitch of the main and the upward pitch of the branches.

The end of the steam main should never be lower than a point 14 inches above the water line of the boiler, and, if possible, a distance of 20 inches should be maintained between the two points. Fig. 3 shows an elevation of the boiler and return connection of a piping system as shown in plan in fig. 1 and clearly indicates the space to be maintained between the two points. Fig. 3 shows an elevation of the boiler and return connection of a piping system as shown in plan in fig. 1 and clearly indicates the space to be maintained between the end of the main and the water-line of the boiler.

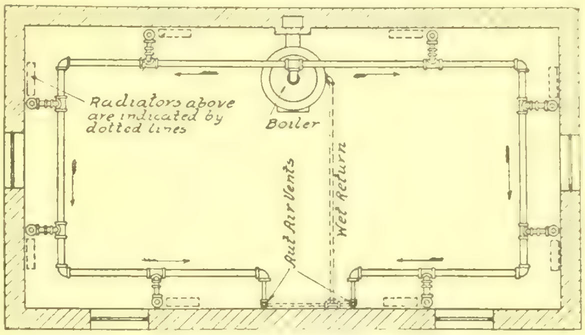


Fig. 4—Divided-Circuit System of Heating

Divided-Circuit System

The divided-circuit or two-circuit system is quite similar in its general plan to the single-circuit, and what has been said regarding the details entering into the one will apply to the other. When the boiler is located on one side of a rectangular building, frequently it is better practice to run the main in two circuits; and the method this provides is known as the "divided-circuit system." On leaving the boiler, the mains pitch down from it in either direction, following around the basement until they meet at the side opposite to the boiler, or perhaps at some other point, the place of junction depending upon the character of the building or on circumstances surrounding the installation. At this point a reducing elbow and an automatic air-valve are placed on the end of each main, and a drop made to the floor of the basement, where, below the water line, these return are connected together, and a single pipe having a capacity equal to that of both the drop pipes is run across the cellar floor, either on the surface or under it, to the boiler, where it is connected into the return opening.

Fig. 4 illustrates the divided-circuit system.

One distinct advantage of a one-pipe circuit system is that all piping is overhead and out of the way. In addition it affords a very neat and attractive method of piping, and will be found sufficiently effective provided care is exercised in properly proportioning the sizes of the pipes. Pipe-sizes for one-pipe systems are given in the following table:

Sizes of Main and Return Pipes—One-Pipe System of Steam Heating

Boiler Pressure, 2 pounds gauge

Sq. ft Direct Radiation	Size of Main	Size of Return
125 to 250 sq ft.	1½ in.	1 in.
250 to 400 sq ft.	2 in.	1¼ in.
400 to 650 sq ft.	2½ in.	1½ in.
650 to 900 sq ft.	3 in.	2 in.
900 to 1,200 sq ft.	3½ in.	2½ in.
1,200 to 1,600 sq ft.	4 in.	2½ in.
1,600 to 2,000 sq ft.	4½ in.	3 in
2,000 to 2,500 sq ft.	5 in.	3 in.
2,500 to 3,500 sq ft.	6 in.	3½ in.
3,500 to 5,000 sq ft.	7 in.	4 in.

Note—The maximum amount of radiation given for any size of pipe is based upon favorable existing conditions, such as a short main (under 100 feet) and a compact job. When the mains are extremely long, and the amount of radiation warrant, the larger size of pipe should invariably be used.

While some engineers consider the sizes as given somewhat excessive, the fitter can make no mistake by adopting them on heating work. Perhaps circumstances surrounding installations in some particular instances might warrant material reductions in the stated pipe sizes; but unless the fitter is fully conversant with the effect these conditions exert on the plant, it is better to be guided entirely by the sizes given, which have been proven by conclusive tests as worthy of general adoption.

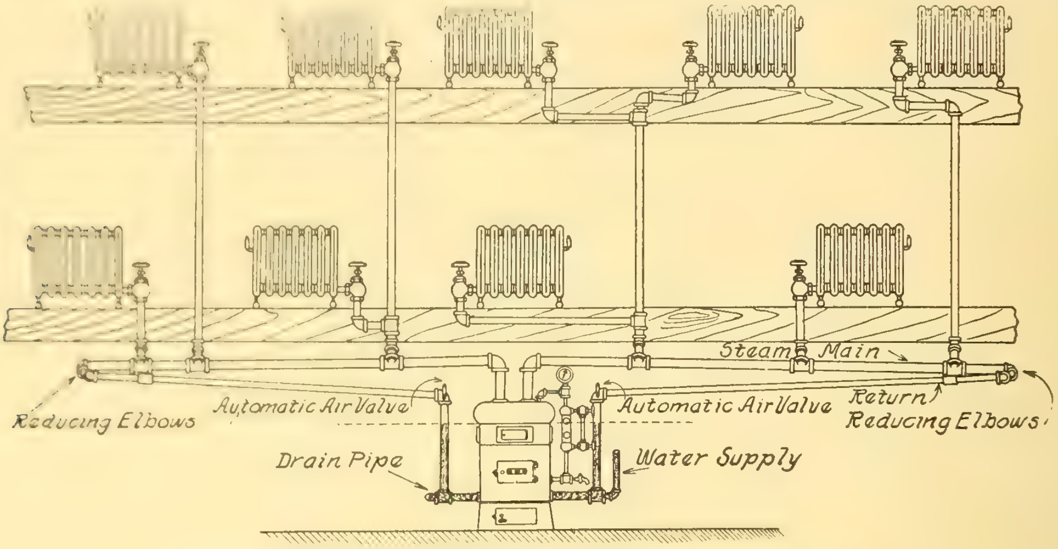


Fig. 5—One-Pipe System of Steam Heating with Dry Returns.

One-Pipe System with Dry Returns

The one-pipe system of steam heating is so called from the fact that there is but one pipe connection to each radiator, this pipe acting the dual role of flow and return. For this reason the use of this arrangement requires pipes larger in size than those necessary for the two-pipe system. There are several adaptations of the one-pipe method, that illustrated in fig. 5 being the one particularly suited to a building where the main flow pipes may be run straight from the boiler in either direction.

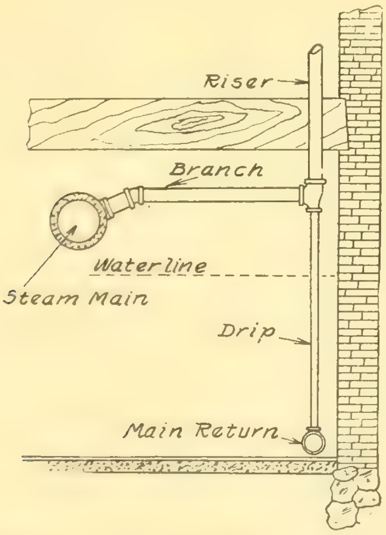


Fig. 6—Bleeding a Riser in Installing a Wet Return System.

Note the manner in which this connection is made. The return pipe is always one or two sizes smaller than the flow, and the connection from main to return is accordingly made with two reducing elbows and a close nipple.

Where the elbow is placed on the end of the dry return for the drop connection into return opening of boiler, an automatic air-vent should be used, and this point should not be less than 14 inches above the water-line of the boiler, as previously described.

All branches are taken from the main with a 45-degree connection and they should always pitch upward from the main at least ½-inch in each 5 inches of length. When supplying large radiators, the branches, as a rule, should be one size larger than the riser or radiator connection which they feed.

It is well to make connections to radiators in such a manner as will permit of some expansion of the riser. A swing joint at base of riser is sometimes employed for this purpose.

One-Pipe System with Wet Returns

The one-pipe system of steam heating with wet returns does not differ materially from any one of the methods previously described so far as the manner of running the mains and connecting the branches is concerned. There are some heating men who favor a wet-return system, believing that the provision of the wet return steadies the working of the system or "balances" the job. This system is specially adapted to jobs where the mains are exceptionally long or when surroundings make it necessary to work unusually close to the water-line of the boiler.

A wet return would be started on a circuit job as soon as the last branch or radiator has been connected, but the drop should not be made directly at the last connection. The main should be extended not less than two feet beyond this point, where a reducing elbow tapped for an air valve should be placed on the end, and the drop then made into a wet return. This return, as a rule, is carried along the cellar wall to a point where a connection with the boiler can be conveniently made.

One method of installing a wet-return system is to bleed all risers, as illustrated in fig. 6. If the job is of such a character that the risers can be treated in this manner, much smaller piping may be employed than is ordinarily necessary with one-pipe work, as no condensation enters the main from radiators or branches, and its entire area is free space for the conveyance of live steam. Also, where risers are dripped into the return in the manner illustrated, it makes no difference in the results attained whether a 45-degree or a 90-degree connection is used in starting the branch from main.

In the collapse of some scaffolding at Strathroy, Ont., last week, Mr. Thos. Maines, contractor, of Watford, Ont., was fatally injured. He died shortly after the accident.

The Value of Contractors' Cost Records

Not Only as Basis for Future Work, but also in Case of Dispute—Particulars of Satisfactory System Used by a Large General Contractor

The importance of cost records on construction work has been pretty generally realized by contractors during recent years and most concerns engaged in work large enough to warrant it have adopted some system by which all expenses on any contract may be determined and classified among a number of accounts, forming permanent records of considerable value. These are of use not alone as a basis for future bids, or as a means of determining the cost of each class of construction from day to day, but as accurate records in case of litigation, especially in the matter of extra work. The system of contractor's cost keeping and organization in use by Mr. Charles Cranford, general contractor of Brooklyn, N.Y., was described at a recent meeting of the Brooklyn Engineers' Club by Mr. Richard L. Russell, who discussed its advantages and explained the use of a number of printed forms used both in the field and in the office in connection with the Brighton Beach improvement work, involving excavation and concrete.

The degree of fineness into which the work is to be subdivided is one of the important factors in any cost-keeping system; the records dealt with by Mr. Russell are intended solely for the use of the contractor who through constant oversight of the work is so familiar with the conditions that few explanatory notes are needed in connection with the costs. Each foreman, under this system, is furnished with a 5½ x 8½-inch blank daily report, containing six ruled columns; the first is headed "Employee's Number," and four are headed "Hours and Amount," the sixth column being used for the total. The laborers' numbers and the hours at each class of work are entered and the total summed up in the last column at the end of each day. Space also is left for remarks. With such a form a man's time may be classified according to the different kinds of work he may have done during the day The foremen also report the daily yardage of excavation and concrete and material received.

Daily and Monthly Statement Sheets

The reports are inspected by the superintendent and if they give the information and cost distribution desired are sent to the storekeeper, who enters the cost and quantity on a "daily statement." This sheet measures 9½ x 12 inches and contains after each foreman's name, under the heading "Excavation" or "Concrete," the total cost for the day, the daily yardage and the cost per cubic yard. Space also is left for entering up the value of materials received and the grand total under each classification is summed up at the bottom of the sheet.

The quantities from the daily statements are in turn transferred to monthly statement sheets which measure 17 x 14 inches, and are ruled so that entries may be made upon them for 31 days' work. On these sheets there are a large number of classifications; for example, the classifications under "Excavation" include work done by buckets, by orange-peel buckets and by hand. There are cloumns under which charges may be made against moving and maintaining buckets, derricks, boilers and engines, and oil and fuel.

The second of the monthly statement sheets covers transportation charges, the third, timber work, and the fourth concrete. Classifications on the latter are as follows: "Massive," "Concrete," "Reinforced Concrete," "Arch Concrete," "Foundations and Drains," "Facing Walls," "Forms," "Cement" and "Conduits." Under each of the first four main headings there are three subdivisions labelled "Mixing and Placing," "Cubic Yards Placed," and "Cost Per Cubic Yard."

In addition to the cost of the work in the field, administration charges are made under the following heads: "Engineering and Superintendence, timekeeper and storekeeper, general office force, telephone and office supplies, liability insurance, surety bonds and legal expenses, rental of yards, office, etc., watchmen, interest, depreciation on general plant and miscellaneous small tools, interest and discount. The daily general expense, under this system, is proportioned by the engineer among the various items and included by the storekeeper in making up the daily statements previously referred to.

Requisitions for materials are made by the storekeeper and submitted to the engineer for approval. If approved, orders are made out in triplicate on forms of three colors for ready identification, the original going to the manufacturer or dealer, the duplicate to the storekeeper and the triplicate being retained in the main office. When the invoice is received it is forwarded to the storekeeper and checked against the original order and returned to the main office.

The voucher system is used in settling all bills and payrolls; the bills are enclosed in folded vouchers on the back of which are spaces for the name of the creditor, distribution of the amount, number, date of check, date of bank, and date on which the voucher was recorded and distributed. The regular cash book, ledger, journal and voucher book are kept. In the latter the horizontal lines across the double page are numbered consecutively, one line to each voucher and the vertical columns contain first, the number of the voucher; second, the total amount, and, third, the number of the contract and the amount to be charged against it. By this system the total amount of each contract is shown.

Good Plumbing as a Paying Investment

If the average property owner will only take time to consider the question he cannot do other than admit that the plumbing outfit of the ordinary dwelling or flat is, after all, the most difficult to maintain in proper sanitary condition and repair. This will become all the more apparent if the person interested will but examine his pile of repair bills for cleaning out traps, installing new supply pipes, closets, basins and innumerable small parts so important to the successful operation of the plant.

Usually the tenant is blamed for such a state of affairs, although in many instances the real fault may be traced to defective installation and the employment of light materials, which are unfit to properly withstand the wear and tear caused by the elements. It has often been pointed out that the method of conveying water through a building is a simple problem, requiring no especial ability on the part of the mechanic, while, on the other hand, the disposal of excrement without unnecessary odor or the violation of established plumbing regulations is an entirely different matter.

Providing the rough work has been installed in a proper manner, and heavy material is used, little trouble is likely to follow; but often an error is committed in finishing with seconds, or an inferior grade of materials, such as thin traps, pitted closets and basins or other weak or damaged parts. Under such circumstances there is but one sensible thing to do, and that is to rip them out and have the job done right and by an experienced plumber.

Methods of Waterproofing Road Surfaces

The Problem of Economical Construction—Pointers on the Application of Tar Satisfactory Results from Broken Granite and Tar Compound

By Geo. W. Manning, Surveyor to the Staines, Eng., Rural District Council.

This is a subject which possibly at the present time is receiving more attention from the road mender, the road user, and the general public than any other, except possibly rubber in its many forms; but as a large proportion of the trees to produce this valuable waterproofing agent have yet to be planted, we need not discuss that material at great length.

Since motor traffic of all classes has become such an acknowledged fact, it has always been a source of astonishment to the author—and very possibly to others, who, like himself, are spending the greater portion of their lives in attempting to solve the problem of economical road construction—to see how many amateurs there are who are willing to give advice upon the subject of what class of materials to use and how to proceed to construct the ideal road surface. It is unfortunate, however, that these good gentlemen generally forget the purse, and have not to face the indignant ratepayer, without doubt the greatest stumbling block in the way of the poor struggling road-mender.

In these notes it is proposed to deal only with the general question of highways and not with roads that carry such a traffic as to warrent their being paved. It has generally been accepted by surveyors that up to the present, tar, used in some form or other, is the most convenient material to cheaply waterproof the everyday road surface by painting or spraying.

The Application of Tar

Before any successful work can be done with tar it is absolutely essential that the surface shall be true and even, and it is towards this end that the surveyor has been devoting his attention. In the author's own opinion, many years must elapse before anything approaching a majority of our roads will be even tar-painted, as quite 75 per cent. of the surfaces are totally unsuitable to take tar. The cost of amendment, such as strengthening the haunches, giving the road a reasonable camber, breaking up the crown and sifting out the accumulations of muck and rubbish in them and restoring the surface with only good clean material, will be so enormous as to make the safe and universal tarring of roads almost beyond possibility.

The word "safe" is used advisedly, as the author has seen tar put on a road with a cross section something like a semicircle, or possibly worse; this was in a hunting county. The result was that the road was rendered absolutely unsafe for practically every class of traffic, and the general fault-finding soon caused the road to be broken up and re-rolled. In this case the cost of proper reconstruction before attempting to waterproof was too great to think about. Again, the author has seen tar applied to a road surface mostly composed of muck and some metal, with plenty of pot-holes in it, but with a suitable cross section. This surface was, however, slightly damp when the tar was applied, and the condition of that road throughout the past winter beggars description; it was quite a common occurrence for a car to find itself sliding into the channel or endeavoring to work crab-fashion through the slime, while the condition of the unfortunate pedestrian or carriage that happened to be in the neighborhood of the road when a car passed can be much more easily imagined than described.

Given the road surface in a reasonably suitable condition as to strength, camber, and regularity, the surveyor is again met with great difficulties in getting anything like good and lasting results from spraying or painting, as the climatic conditions in England give, comparatively speaking, a very few days in a season when the road surface is in the best condition to assimilate tar and to obtain the desired results. It simply ends in the surveyor, worried to death by the growls of the aforesaid "indignant ratepayer" against the clouds of dust raised by cars, etc., from the drying mud, being tempted to apply tar to a surface which appears dry, while, as a matter of fact, the body of the road is quite wet and refuses to take it.

Tar Painting and Spraying

The experiences of the past winter, after a summer in which the roads were never dry, more than amply proves the argument that tar painting or spraying all and sundry road surfaces, with the expectation of obtaining anything like a lasting waterproof surface, is a delusion. There are lengths here and there which before painting have been properly reinstated and have been tarred at fair condition as to dryness, have stood the winter very well, but the author motored many hundreds of miles to find them, and they have all been where the conditions have been ideal, lying high and dry, well exposed to the action of the sun and wind, with not too much traffic, especially of the slow-moving type. In this neighborhood tar-painting vanished early in the autumn in a slough of mire, which not only rotted the roads through and through, but caused bitter complaint everywhere.

The deductions the author has drawn from the various methods of tar-spraying and tar-painting as a waterproofing agent for roads during the seven or eight years he has had experience of it are, that it does very materially effect this object when road and other conditions are suitable, while its effect in keeping any class of road together throughout the summer is undoubted. The author is, however, equally confident that tar-painting, applied haphazard to any road surface, must not be accepted as a waterproofing agent, but rather as the most permanent palliative to reduce the dust nuisance during the dry months of the summer. This dressing, except in isolated cases, does not enter the body of the road at all, and simply churns up into black mud under the traffic when the autumn rains and frosts commence, leaving the pores of the roads exposed to the worst action of the winter weather.

Use of Tarred Slag

Since early in 1903 the author has been turning his attention closely to the question of reinstating the surfaces of his roads, as they become worn, with a waterproof material. He has tried a number of the various materials placed upon the market, and some of his own making. His first experiment was with tarred slag, and it was a most satisfactory one. The author has laid numerous lengths of this class of material, but of recent years the supply of good, close, suitable slag appears to be giving out and that of an inferior quality to be taking its place; the result is that surfaces which have only been laid for less than two years have had to be thoroughly repaired, so many pot-holes having appeared. The author's council is now abandoning the use of tarred slag as a waterproofing for their roads.

Several miles of road surfaces have been laid with ordinary broken granite rolled into a matrix mixed with a tar compound, and the surface sprayed over with the same compound. These surfaces have given satisfaction, but they need touching up every year, or every other year, according to the traffic. This, however, is to a certain extent an advantage, as the painting freshens up the body of the material and at the same time forms a veneer of tar and granite chippings, which to a great extent prevents the traffic coming into direct contact with the main body of the road, and so enhances its life. This class of road being waterproofed in itself, can be painted and attended to at a time when it would be madness to think of doing any such work to an ordinary road.

Tar-Grouting Macadam

The author's experiments in tar-grouting ordinary granite macadam have not been very satisfactory, either from an economical or permanent point of view. He found so many little details which continually crop up to delay the job or detract from its well being; for instance, a sudden storm means much delay and increased cost, to say nothing of inconvenience to the public. In any case, where a road is laid in this manner, and except in the very best of weather, the author considers it advisable to use a blow lamp to effectually remove traces of damp and to warm up the stone to more easily assimilate the tar. Some of the systems of tar grouting have, he is aware, given very satisfactory results upon the outside of tramlines, etc., but the cost put its general use for highways outside the pale of practical politics.

The author has laid considerable lengths with granite macadam broken in irregular sizes from 2¼-inch downwards, and coated with a tar compound. This has given capital results as a waterproofing material, and has the great advantage of being able to be laid at all reasonable times and with the least likelihood of delay from outside causes.

The author's experiments since 1903 have satisfied him that in districts where the annual allowance for highway repairs will permit of it, the surveyor is much better advised to look to construction than anything else for the solution of the problem of building suitable waterproof roads to suit modern requirements. The comparative costs in his own district prove this very conclusively. Such a class of repair is, of course, quite out of the question for the ordinary country district, and the author certainly thinks that, so far as the bulk of the highways are concerned, we are as far off the solution of the problem as ever, except that we are now perfectly satisfied that one of the schemes mooted to date are workable, solely for the want of that simple agent "capital."

Business Opening in Western Canada

Aldersyde, Alta.—Brick plant.

Barons, Alta.—Electric light plant.

Castor, Alta.—Sash and door factory, electric light plant, brick plant.

Govan, Sask.—Sash and door factory, light and water plants, brick plant. It is stated that there is a demand for dwellings at this point and that there is a good opening for a contractor with capital, who would build and rent houses.

Sedgewick, Alta.—Brick plant.

Strassburg, Sask.—Planing mill and wood working shop. Scarcity of residences. Good opening for a contractor to build small houses for renting.

Mr. Dufresne, of the Public Works Department, at Winnipeg, has been transferred to Ottawa to take the position of deputy chief engineer in the place of the late Mr. Gilmour Brown. His place at Winnipeg has been filled by the appointment of Mr. Earle, formerly manager of the street railway company of St. John, N.B.

Mr. S. E. O'Brien, secretary to the chief engineer of the Department of Public Works, Ottawa, is mentioned for the vacancy caused by the lamented death of Mr. Napoleon Tessier, Secretary of the Department.

Personal News and Notes

Mr. G. T. Altham, town engineer of Macleod, Alta., has resigned.

The new manager of the Standard Fitting & Valve Company, Guelph, Ont., is Mr. A. W. Givin.

The death occurred last week of Mr. Eli Snyder, a well known building contractor of Parkdale, Toronto.

Mr. R. F. Armstrong, Toronto, has left for Moncton, N.B., to take up a position on the engineering staff of the G.T.P.

Mr. C. M. Canniff, president of the Engineers' Club, Toronto, and, until recently, chief engineer of the Expanded Metal & Fireproofing Company, has formed a partnership with J. S. Fielding, consulting engineer. The offices of the new firm will be at 15 Toronto street, Toronto. Messrs. Fielding & Canniff will specialize in steel and reinforced concrete work. Both of the partners in the new firm are widely known in engineering and contracting circles and the best wishes of their many friends will go out for their success.

Mr. C. M. Canniff, of the newly organized firm of Fielding & Canniff, Consulting Engineers

The headquarters of Mr. T. Aird Murray, consulting engineer, are now located at 303 Lumsden Building, Toronto.

Mr. G. D. Whitmore, consulting engineer, Regina, Sask., has acquired the services of A. E. Eastman, of Lachine Locks, Que.

Mr. W. F. Tye, vice-president of the Canadian Society of Civil Engineers, has removed from Montreal and taken up his residence in Toronto.

City Engineer Ker, of Ottawa, is unfavorable to the use of cement macadam for paving work. He considers the material too brittle to be satisfactory.

A permanent builders' exhibition has been established at Edmonton, Alta., by the manufacturers and builders' associations affiliated with the building exchange of that city.

New Westminster, B.C., has just adopted a building by-law that takes four hours to read. Each alderman has had to make an affidavit that he has perused the document.

Mr. W. H. Shillinglaw, of Brandon, Man., was injured in the collapse of some building work last week. We are glad to state that he is making satisfactory progress towards recovery.

[illegible] [illegible] Limited, Toronto, have been appointed Canadian agents for the General Electrical Company, Limited, of London, Eng., manufacturers of electrical apparatus and supplies.

St. Thomas builders are to have a novel feature in connection with their Dominion Day picnic. There will be a plumbers' competition for those who can join up pieces of waste pipe in quick time.

Mr. A. M. Jones, Ottawa, has been appointed assistant engineer on the construction of the new Quebec bridge. For several years past Mr. Jones has been resident engineer for the C.P.R. at the Federal Capital.

At a meeting of the building trades council at St. John, N.B., the following officers were elected: Jacob Brown, of the Sheet Metal Workers' Union, president; James McGirr, of the Masons' Union, vice-president; and James Sugrue, of the Carpenters' Union, secretary-treasurer.

Vancouver and the Coast

As a result of the scarcity of desirable "near in" homes, and the disinclination of many people to assume the cares that are part and parcel of ordinary housekeeping, there is a strong and constantly growing demand for flats, and to supply this need a number of roomy apartment houses have been erected and others are under way or projected. These buildings are divided into suites of three, four, five and six rooms, and embody all modern accessories to luxurious living. The rents are high, of course, but the suites are eagerly snapped up weeks before they are ready for occupancy. A leading architect predicts that in the course of a few years the greater portion of the west end will be given up to apartment houses, and at the rate these human hives are being constructed it would seem that the prediction appears likely of fulfilment.

The rapid growth of Vancouver has compelled the removal of the Customs to the first floor of the new Federal building at the corner of Granville and Hastings streets, where there is room for growth, even if it be at the same rapid rate of the last two decades. After the fire which destroyed Vancouver on June 13th, 1886, a Customs house was opened on Abbott street in quarters only 12 x 10 feet in size, most of which was taken up by a huge safe. The office was in charge of the late Isaac Johns as sub-collector for the outport of Burrard Inlet, then under the port of New Westminster. On July 1st, 1887, Vancouver was constituted a port, Mr. J. M. Bowell, who still holds the office, being appointed collector. The offices were then moved to a building on the site now occupied by the Canadian Bank of Commerce. For the fiscal year ending June 30th, 1893, the returns were $318,000, the number of entries being 8,406, while for the current fiscal year the returns are $3,900,000, with 68,000 entries, an average increase of about 3,500 entries per year. The staff now numbers about 70 employees.

The Canadian Slate Products Company, which some weeks ago secured from Seattle parties the patent rights to manufacture in Canada certain products that are finding a wide sale among United States builders, is establishing a large plant at Vermilion, Alta. The outlay will exceed $150,000, and it is said that from 250 to 500 hands will be employed. The company's article is a new composite substance consisting mainly of shale, cement and lime. The slate can be polished like marble or granite, is susceptible of all manner of coloring, and can be manufactured so cheaply that it can be used for wainscoting, flooring, roofing, counter tops, fireplaces, etc. The company is locating in Vermilion because that place contains the raw material which is necessary to the manufacture of its products and has excellent railway facilities. The company holds the rights to manufacture and sell from Montreal to Vancouver, and it is its intention to extend its plant so as to employ from 1,000 to 1,500 people. It will also establish warehouses and agencies in many of the principal cities in the country, Vancouver among them. To permit of this expansion, the capitalization of the company is $2,500,000.

Work on the new plant for the Steger Silica Brick Company was commenced a couple of weeks ago, and is being rushed will all possible speed under the superintendence of Mr. Joseph Farrier, secretary-treasurer of the firm, who recently arrived from Bonham, Texas. Modern machinery will be installed and the plant will have a capacity of 40,000 bricks per day.

A French syndicate of capitalists which recently bought the southwest corner of Granville and Cordova streets, opposite the C.P.R. station, has secured plans for an eight-storey office block, to cost over $250,000. The building will have a frontage on Granville street of 120 feet, and 78 feet on Cordova street. The structure will be fireproof throughout.

The fertile district known as the Delta, near the mouth of the Fraser, is to have an up-to-date waterworks service in the near future. From the lowest level of the springs that are to be tapped, to the gulfside, there is a fall of from 12 to 13 feet, so that no trouble will be experienced in distributing the water in the mains. Two cement reservoirs will be constructed on an elevation of 250 feet.

Wood Block Paving

The rapidity with which asphalt pavement wears out, especially along the streets where there is a great and increasing amount of automobile traffic, has caused many automobile tradesmen to look around for more suitable paving material, and in the wooden block, it is claimed, they have found it.

W. J. Mead, secretary and general manager of the Olds Motor Works, of St. Louis, says: "To those who believe, as I do, that the number of automobiles of both the pleasure car and the commercial type will be doubled and trebled in this country within the next few years, it is apparent that the municipal authorities must give more consideration to the needs of motorists than has been their custom. It has been the invariable rule of city officials to consider only the horsemen when making plans for repaving streets, but there are even now so many motor cars in use that owners of them ought to receive more consideration.

"Asphalt pavement wears out quickly, and the holes that result are very, very bad for automobiles. Wood block pavement, on the contrary, does not cut so fast, and even when it does finally wear out, the wearing down is gradual and does not leave the gaping holes that may be seen in any street paved with asphalt. It is practically impossible to prevent some oil and grease falling from the cars to the pavements. This rots asphalt very quickly, but its only effect on wooden blocks is to preserve them. For this reason alone, the economy of wood blocks ought to be enough to ensure their adoption.

"Annther reason for doing away with asphalt and using wood blocks is the skidding danger, which is ever present whenever the asphalt streets are sprinkled or after rain storms. The skidding danger on wet asphalt can hardly be exaggerated, but there is very little danger of skidding on wet wooden block paving."

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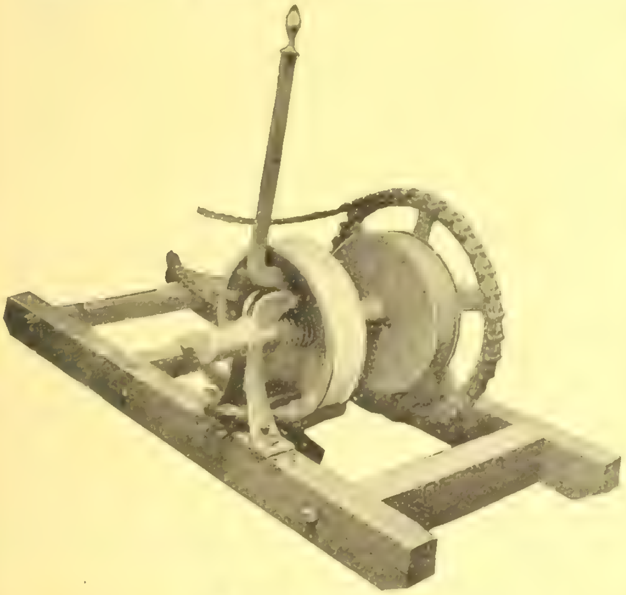

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"London" Friction Clutch Hoist

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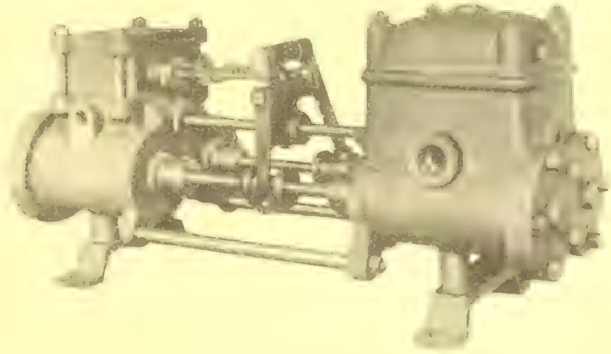

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Opportunities for Business

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing [illegible] stamped envelope and stating number of enquiry.

[illegible] Agents.—A London firm manufacturing concrete machinery, concrete mixers, etc., wishes to introduce them to the Canadian market and are prepared to appoint agents.

[illegible] Builders' hardware, woodworking machinery, railway motor cars, etc.—A firm in New Plymouth, New Zealand, are in the market to purchase various goods under the above headings from Canadian firms. Bank references.

[illegible] Agents.—A west of England firm manufacturing encaustic, enamelled, white, cream and other glazed tiles, also patent tile fenders, wish to appoint Canadian representatives.

[illegible] Agents.—A Lancashire firm manufacturing mechanical ventilation specialties wishes to be placed in communication with first class Canadian firms open to take up their agency.

Technical Literature

The New Building Estimator, by William Arthur; published by David Williams Company, New York; third edition, revised and enlarged; price, $2.50.—A practical guide to estimating the cost of labor and material in building construction, from excavation to finish; with various practical examples of work presented in detail, and with labor figured chiefly in hours and quantities. A carefully compiled, compact work that should prove of much assistance to architects, contractors and engineers. Contains information that should be very helpful in the solution of estimating problems.

Hicks' Builders' Guide, published by David Williams Company, New York; 20th edition, revised and enlarged; price, $1.—Furnishes concise and ready reference for contractors and builders. Contains 114 illustrations relating to the practical phases of building construction. Details, in proper sequence, the various steps that should be taken in figuring the various contracts of a building, and sets forth in tabular form lists of items and quantities that should be of much assistance to the estimator.

Estimating Frame and Brick Houses, Factories, etc., by E. T. Hodgson; published by David Williams Company, New York; 8th edition, revised and enlarged; price, $1.—Contains a detailed estimate of a $5,000 house and additions. Detailed estimates of kitchen, dining-room, parlor, den, halls, bedrooms, conservatory, basement, bathroom, closets, etc., all figured out and measured by the quickest and simplest methods. Also shows how to estimate by cubing, by the square of floors or walls, and by the process of comparison; with hints and practical suggestions for taking measurements and making tenders for work.

A visitor to Montreal last week was Mr. Albert Vickers, of Messrs. Vickers, Son & Maxim, the well known English firm. The object of Mr. Vicker's visit is stated to be an investigation of the dry dock proposition, now under consideration at Montreal.

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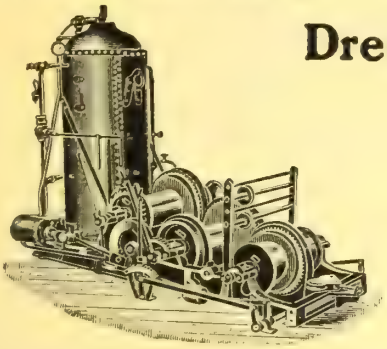

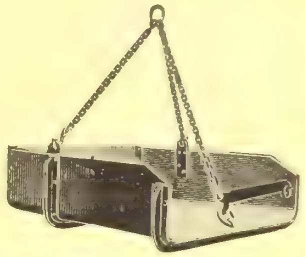

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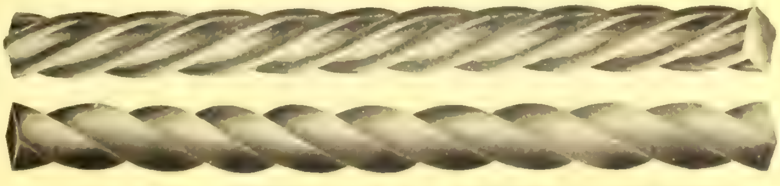

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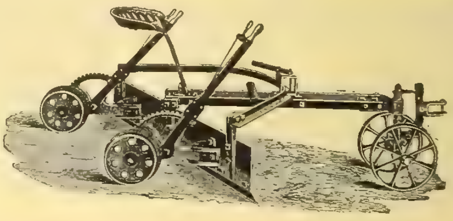

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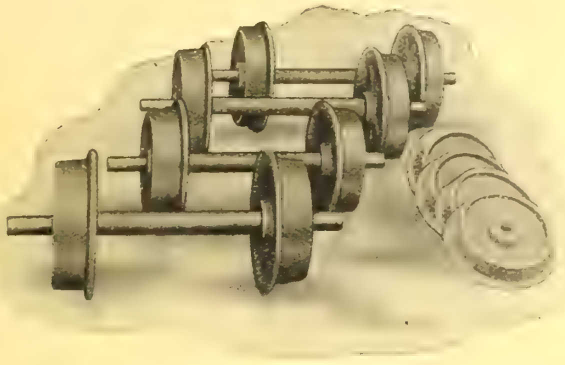

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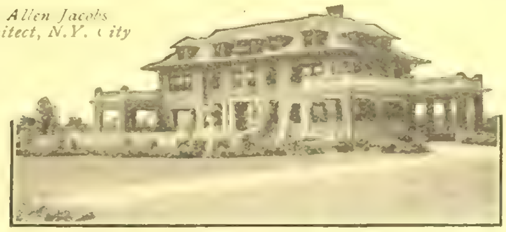

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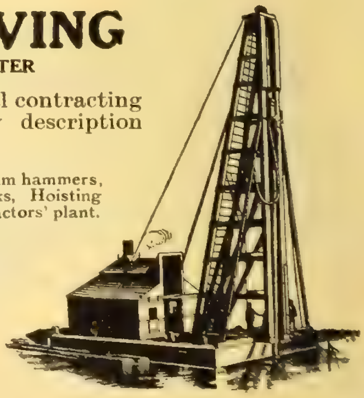

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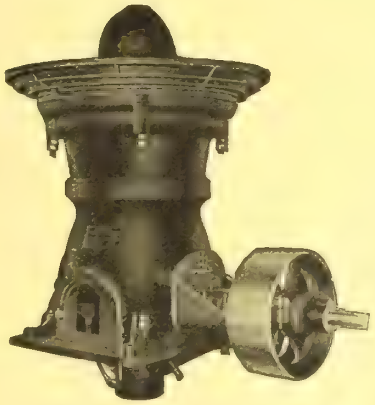

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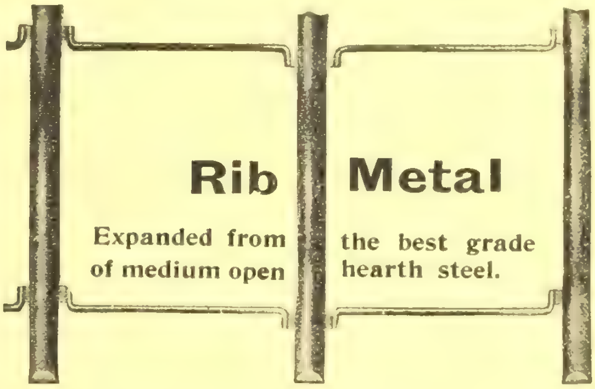

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Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red bricks...........	$18.00
No. 1 dry pressed buff bricks...........	18.00
Red stock bricks	12.00
Grey stock bricks	10.00
Wire cut bricks for foundation work.. ....$10.00 to	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from ....$80.00 to	$150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b, with 30 and 5 per cent. off for wholesale:—

	Star.	D,D.
10 to 25 united inches......	$4.25	$ 6,25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17,50
Brass Goods, Valves, etc.		
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
Breaks.	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.......	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.......	4.25	3.75	7,25	5.50
50 u. i.......	4.75	4.25	8.75	6.50
60 u. i,.......	5.00	4.75	10.00	7.50
70 u. i.......	5.25	5.25	11.50	8.50
80 u. i.......	5.75	6.00	12.50	9.50
85 u. i.......	....	....	14,00	10.50
90 u. i.......	....	....	16.50	11.50
95 u. i.......	.,..	....	18.00	13.50
100 u. i.......	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, an color, ¾-inch square, 1-inch hex, and 3-16 inch round, 58 cents per square foot up.
Floor Tile—½-inch square 65 cents.
Wall Tile—Rock faced sizes 6 x 2 inch 3 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.
Vitreous Tile—All sizes, according to color 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, firsts 70 cents.
Capping Coves and corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 and 5 per cent.
High grade compression work, 60 per cent.
Cushion work, 55 per cent.

Fuller work, 70 per cent,; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent,
Flatway stop and stop and waste cocks, 70 per cent.; roundway, 55 per cent.

No. 4 compression bath cock.........net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 55; iron, 60 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per per cent.

Boilers—Galvanized Iron Range,

30-gallon, standard, $4,50; extra heavy, $7.00.

CastIron Sinks.

16 x 24, $1 00; 18 x 30, $1.15; 18 x 36, $1 95

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per pound; traps and bends, 50 per cent.

Iron Pipe.

Size. (per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2,03	¼ inch......	$ 2.86
⅜ inch	2.25	⅜ inch......	3.08
½ inch	2.63	½ inch......	3.48
¾ inch	3.28	¾ inch......	4.43
1 inch	4.70	1 inch......	6.35
1¼ inch	6.41	1¼ inch......	8.66
1½ inch	7.70	1½ inch......	10.40
2 inch	10.26	2 inch......	13.86
2½ inch	16.39	2½ inch......	22.14
3 inch	21.52	3 inch......	29.07
3½ inch	27.08	3½ inch......	36.58
4 inch	30.78	4 inch......	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent,

7 and 8-inch pipe, 40 per cent.
Light pipe 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL. Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement wholesale lots of 1,000 barrels f.o.b. Toronto, bags extra, $1.60.
Cement, car lots, f.o.b, Toronto, bags extra, $1.75.
Crushed stone, $1.25 per ton, f.o.b. Toronto,
Binder stone, $1.25 per ton, f.o.b. Toronto.
Burnt River rubble, stone delivered, $14 to $15 per toise.
Free stone delivered, $14 to $15 per toise.
Brown coursing stone, delivered, $3.25 to $3,50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.
Brown sills and beads, in the rough, delivered, 35 cents per foot.
Rubble stone in car lots, $1.25 to $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per thousand.
Steel channels and beams, $2.75 per 100 pounds, delivered, f.o.b. Toronto.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.
Lime, per cwt., delivered, 38 cents,
Plaster Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Hard Wall Plaster, unsanded, $10.50; sanded $5.50;; universal finish, $15.50.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.00 to $6.25 per 100 lbs.
Pure XX Zinc White, ground in oil, $7.50 to $8.00 to $9.00 per 100 lbs.
Pure Florence Green, ground in oil, $12.50 to $13.50 per 100 lbs,
Boiled Linseed Oil, in barrels, 95 cents per gallon of 9 lbs.
Raw Linseed Oil, in barrels, 92 cents per gallon of 9 lbs.
Turpentine, in barrels, 85 cents per gallon.
Pure Linseed Oil Putty, 25-lb. tins, $3.75 per 100 lbs.
Pure Linseed Oil Putty, bulk, in barrels, $3.25 per 100 lbs.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Harwood & McLean, electrical contractors, Winnipeg, Man., are stated to have dissolved.

T. S. Lawley, lumber dealer, Blucher, Sask., has been succeeded by Lawley and Dunstead.

Stone Bros., lumber and implement manufacturers, Rapid City, have been succeeded by H. Hindson.

It is stated that the assets of James Day, Fauvel, Que., saw and grist miller, are to be sold 21st inst.

The B. C. Gazette gives notice of the incorporation of the following companies:—Princeton Waterworks Company, Limited, capital, $25,000; The Bull River Electric Power Company, Limited, capital $2,000,000; Barkley Sound Power Company, Limited, capital $10,000; Prince Rupert Sheet-Metal Works, Limited, capital $10,000, incorporated to carry on the business of sheet-metal workers, plumbers, etc.

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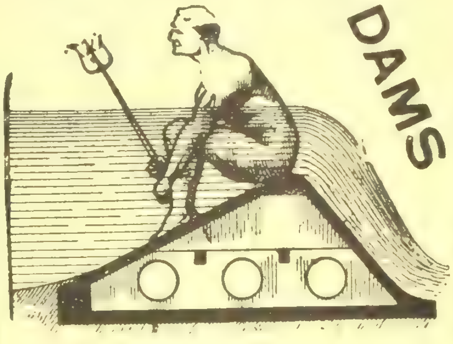

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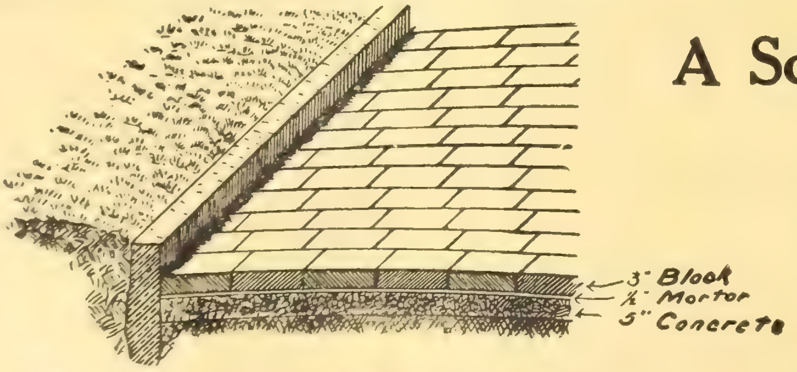

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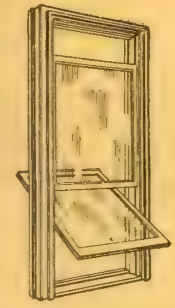

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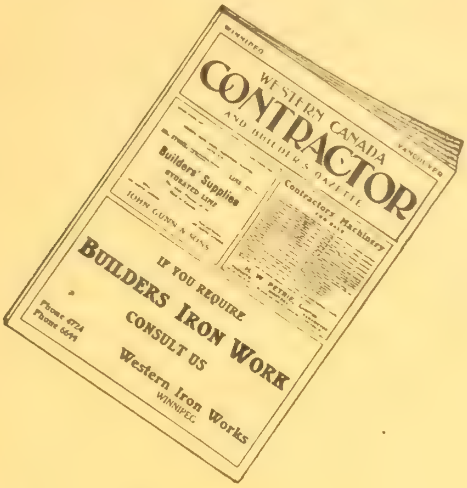

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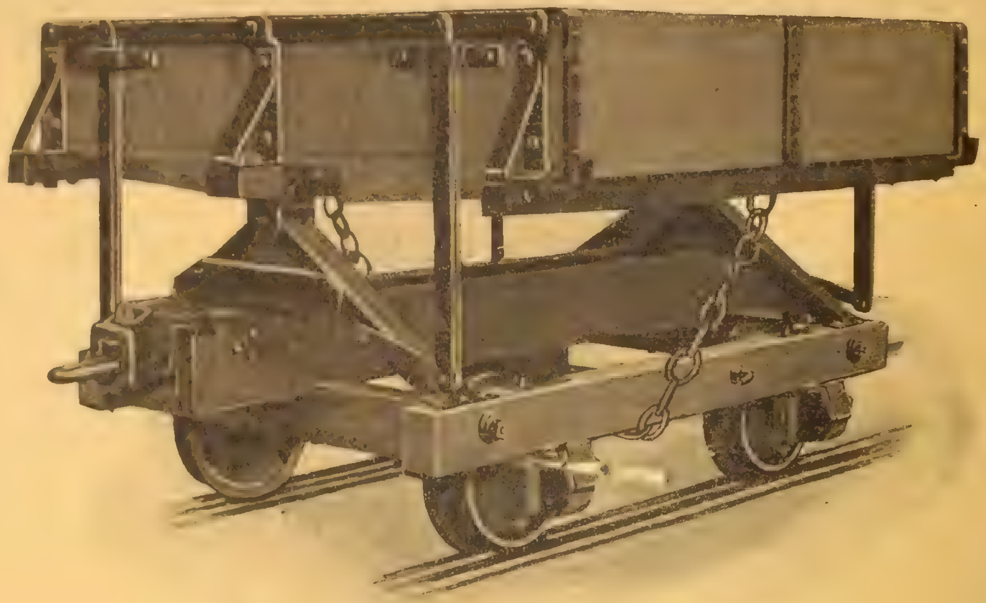

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